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# 1. UNIFIED NASA INFORMATION TECHNOLOGY SERVICES (UNITES) MISSION

## 1.1 MISSION STATEMENT

NASA is comprised of Headquarters (HQ) in Washington, D.C., five strategic Enterprises, nine Centers throughout the country, and a number of additional installations that support specific Centers. The NASA HQ's role, the Enterprises' roles and the Centers' roles are distinct in carrying out the NASA mission. HQ defines the NASA mission and explains why it is necessary. The Enterprises are charged with executing and implementing that mission. The Centers (e.g., MSFC) determine how the Enterprise programs will be implemented, and execute Agencywide programs as they are assigned.

The nature of NASA's program implementation model requires cross-Center collaboration for the execution of the strategic Enterprises' programs. Enterprise programs and HQ initiatives are executed across multiple centers. NASA requires a seamless technical infrastructure to ensure interoperability within programs and across Centers. The Centers have the responsibility to implement and manage that technical structure.

Agencywide NASA corporate initiatives and resulting MSFC-hosted programs are the primary drivers that define MSFC's IT requirements. The Agency's business model is transitioning from one based on autonomous Centers to a more tightly coupled organization with business processes executed across Center and organizational boundaries. NASA is aligning all support services to mission programs (shared infrastructure services model) and will need to drive cost savings through consolidated support services and other opportunities for increased efficiencies. MSFC-hosted programs range from self-contained, mature operations requiring basic commodity support to new, increasingly complex startup programs requiring collaborative engineering environments across NASA centers and beyond.

Because IT comprises a substantial part of the Agency's overall budget, it must be managed strategically, fully aligned with customer needs, and evaluated to ensure successful performance. MSFC's IT service providers must function as IT partners with our customers, who are increasingly recognizing the criticality and value of IT to their programs. Within this framework, the contractor's mission is to manage, be responsible for, and provide IT services to meet the requirements defined by this Performance Work Statement (PWS). The contractor shall: (a) operate and maintain existing equipment, software and services; (b) gather, analyze, define, and document systems requirements; and (c) plan, design, develop or acquire, integrate, test, and implement new systems or enhancements to existing systems for the following services:

   a. Agencywide Information Services: These services include IT security, National Security Systems, wide area network, control center, data center, applications, Digital Television (DTV), Russia IT support, and customer

services. These services also include development and maintenance of Agencywide applications, services, and systems delegated to MSFC.

b. Integrated Financial Management Program (IFMP) Integration Services: These services are provided to the IFMP Integration Project Office (IPO) at MSFC. These services include infrastructure support, module project support, and operations and sustaining support.

c. Marshall Space Flight Center (MSFC) Services: These services include IT systems support for programs and projects for which MSFC is responsible. These services include applications software, web, midrange computer systems, telecommunications, IT security, audiovisual information, documentation repository, hardware maintenance, IT procurement, and customer support.

For the purposes of this PWS, the customer is defined as the end-user of the services described regardless of geographic location. A customer may include a NASA Program/Project office, Staff office, NASA contractor, or an individual within these organizations.

MSFC is committed to safety, quality, and core values. As a result of this, a MSFC Safety, Health, and Environmental (SHE) Policy, a Quality Policy, and MSFC Core Values have been established.

a. MSFC SHE Policy
   1) Safety: MSFC will strive to prevent human injury and occupational illnesses and ensure safety for all operations and products.
   2) Health: It is MSFC's policy to promote and maintain the physical and mental well-being of its employees.
   3) Environmental: MSFC will strive to protect, preserve, and enhance the quality of the environment while conducting their primary mission activities.
b. MSFC Quality Policy
   MSFC policy is to provide quality products and services to our customers through the MSFC Values.
c. MSFC Core Values
   People, Customers, Excellence, Teamwork, and Innovation.

## 1.2   RESPONSIBILITIES

### 1.2.1   Agencywide Responsibilities

NASA's complex strategic objectives are demanding increasing levels of collaboration and seamless operation across all NASA installations, with other Government entities, and with external partners. In order to more effectively support collaboration, to provide information superiority, and to augment data security, NASA has undertaken an initiative to create the One NASA IT environment and corporate infrastructure. The Agencywide responsibilities articulated in this PWS are delegated by NASA Headquarters to be performed by MSFC and other Centers.

### 1.2.2    IFMP Integration Project Office (IPO)

The IFMP IPO, within the Center Operations Directorate, establishes and maintains an Agencywide Enterprise Resource Planning (ERP) system Competency Center that provides integrated business process support, functional support, application development/maintenance, and application operations. The IFMP IPO is responsible for defining the technical architecture, acquiring all components of the technical infrastructure including hardware and system software, and supporting the Implementation Contractor in the initial installation of the software. In addition, the IPO is responsible for the operation and maintenance of the entire system environment after the initial software installation. The IPO is also responsible for establishing and implementing an enterprise application integration architecture that will be utilized in the development and deployment of all interfaces to IFMP module applications.

### 1.2.3    Office of the Chief Information Officer (CIO)

The Office of the CIO, within the Center Operations Directorate, is the principle MSFC Organization responsible for all MSFC IT related functions as well as delegated Agencywide IT processing resources. The CIO is responsible for developing the Center IT strategy, IT architecture, IT investment management and tracking, and IT customer relationship management. The Office of the CIO utilizes a process-oriented methodology of governance to effectively manage the acquisition, provisioning, use, and oversight of information technology resources. Innovation and learning are at the heart of the CIO management philosophy. In the execution of these roles, the CIO has total system management responsibilities that include long-range planning, requirements definition, alternative analysis, design, acquisition or development, integration, testing, implementation, and ongoing operations, maintenance, and administration of both hardware and software. With some exceptions that are delineated in this PWS, all of the aforementioned resources are considered CIO managed.

The CIO uses service level management, customer feedback, and continuous improvement processes to maintain high quality services that are cost effective and efficient and produce the highest levels of customer satisfaction. Strong customer relationships are put in place to achieve clear understanding of customer goals, with service level agreements describing the services to be provided. The CIO will evaluate the contractor's performance per the Award Fee Evaluation Plan (Attachment J-5).

### 1.2.4    Contractor

The contractor is designated "Systems Manager" for CIO managed systems listed in Appendix A, Category I. The contractor shall have limited responsibility for the systems listed in Appendix A, Categories II and III. The contractor responsibilities include long-range planning, requirements definition, alternative analysis, design, acquisition or development, integration, testing, implementation, and ongoing operations, maintenance, and administration of both hardware and software. The contractor shall assess the feasibility and cost effectiveness of new technology and provide

recommendations for the rationalization of existing technologies (e.g. technology retirement).

The contractor shall provide the customer services described in Sections 3, 4, and 5 of this PWS. In providing these services, the contractor shall perform the management functions described in Section 2 in an integrated and cost effective manner, and with minimum additional action by the customer. The contractor shall comply with the regulations, procedures, and agreements as defined in Attachment J-10. For example, a new project is assigned to MSFC requiring program planning and engineering analyses. The contractor shall interface with the NASA points of contact and the customer to design, develop, and implement IT services to meet the customer requirements, while ensuring that existing Center resources are utilized to the maximum extent.

When ensuring that existing Center resources are utilized to the maximum extent possible, the contractor shall interface with other suppliers such as Outsourcing Desktop Initiative for NASA (ODIN). These interfaces, as well as interfaces with customers, are defined in Operating Agreements, Memoranda of Understanding (MOU), Memorandums of Agreement (MOA), Interface Control Documents (ICD), NASA policies, and other written agreements.

The contractor shall measure and report the service-level objectives and performance for each of the services defined in this PWS (DRD 974MA-010). The performance metrics for the services are specified in Attachment J-4.

In performing the functions of this contract, the contractor shall clearly and consistently characterize the various services as separate and distinct. This characterization is essential in delineating the different funding and approval procedures associated with each service, and in ensuring accuracy of cost reporting in accordance with the Work Breakdown Structure (WBS), prepared in accordance with DRD 974MA-004.

## 2. PROGRAM MANAGEMENT

The contractor shall provide all resources necessary to accomplish the mission defined in this PWS. The contractor shall provide project management, strategic planning, financial management, contract administration, procurement, asset management, security, safety, facilities management, quality assurance, and customer requirements management to accomplish the mission. The contractor shall provide, implement, and maintain the requisite organization, employee value system, disciplines, and systems necessary to manage the resources required for performance of these functions. In performance of program management functions, the contractor shall:

a. Ensure the implementation of management practices to proactively pursue innovation and technology advancement to enhance customer satisfaction and service delivery.

b. Ensure the implementation of effective engineering, business management, and other quality practices to deliver the services in sections 3, 4, and 5 of this PWS in an efficient and integrated manner. These practices shall also ensure the delivery of services at a sustained high level of success.

c. Implement practices to ensure effective communication of management, technical, quality, costs, and customer satisfaction issues that arise in the performance of this contract.

d. Prepare, implement, and maintain the Unified NASA Information Technology Services (UNITeS) Management Plan (DRD 974MA-001). Operate and maintain management information systems to enable management of the Center's IT portfolio.

e. Develop, implement and maintain a database system to collect MSFC wide IT systems/services information to support the IT Integration function of the Office of the CIO.

f. Prepare, on an annual basis, a MSFC IT Management Plan that will provide a strategy blueprint for the next year as well as implementing guidance for realizing the stated goals and objectives of the Office of the CIO.

g. The contractor shall support the implementation of the MSFC IT Governance program through:
   1) Contributing technical expertise in ex-officio roles in the governance structure.
   2) Performing the Secretariat function on the executive management council and supporting review boards, standing committees, and working groups.

f. Maintain and operate the Government-owned comprehensive, automated, online, and integrated Management Information and Control System (MICS). The MICS shall:
   1) Plan, track, execute, control, and report work accomplishments, schedules, and resources across functional activities (DRD 974MA-006) using the expanded WBS (prepared in accordance with DRD 974MA-004).

2) Track and report planned versus actual resource utilization (DRD 974MA-006).

3) Provide capability for ad hoc query of the data.

4) Provide data that are current and readily available.

g. Maintain and operate the Center Operations Services Management Information System (COSMIS). The contractor shall:

1) Track and report actual resource utilization by UNITeS service and customer to COSMIS (DRD 974MA-006).

2) Develop COSMIS rates on an annual basis for each UNITeS service. These shall be provided to the government for calculating full cost service rates (DRD 974MA-006).

3) Report headcount allocations by full cost accounting pools of MSFC IT services, Center G&A services, NISN services, and corporate G&A services (DRD 974MA-006).

h. Provide Contracting Officer (CO) and Contracting Officer's Technical Representative (COTR)-designated personnel on-line access to the MICS.

i. Provide necessary training for the contractor's personnel to perform the services and functions described in this PWS.

j. Provide technical information concerning any invention, discovery, improvement, or innovation made by the Contractor in the performance of work under this PWS (DRD 974CD-003).

k. In performing the effort delineated in this PWS, the contractor shall provide systems and applications associated with the six covered Electronic and Information Technology Accessibility product groups specified below. All systems and applications associated with these groups shall comply with the applicable standards contained with the Federal Acquisition Circular 97-27, Electronic and Information Technology (EIT) Accessibility, Section 508 of the Rehabilitation Act of 1973 by implementing the applicable Technical Standards (Subpart B) including:

1) Software Applications and Operating Systems (1194.21).

2) Web-based Intranet and Internet Information and Applications (1194.22).

3) Telecommunications Products (1194.23).

4) Video or Multimedia Products (1194.24).

5) Self-Contained Closed Products (1194.25).

6) Desktop and Portable Computers (1194.26).

## 2.1 PROJECT MANAGEMENT

The contractor shall be responsible for performing cost, schedule, risk management, and technical management of all UNITeS services, functions, and tasks. In performance of this function, the contractor shall:

a. Prepare and submit monthly reports of project plans, status, and schedules using the MICS in accordance with DRD 974MA-006.

l. Prepare and conduct monthly program management reviews including presentation and discussion of program priorities, project statuses, significant accomplishments, risk management, and problem areas.

m. Prepare and submit status, progress, and problem information in the Weekly Activity Report in accordance with DRD 974MA-006.

n. Track official communication with the COTR such as technical direction, requests for information, and transmittals, and provide status concerning all such communications (DRD 974MA-006).

o. Track monthly export control activities and report in accordance with DRD 974MA-009.

p. Prepare and submit the Certification of NISN Systems Readiness in accordance with DRD 974MA-011 and participate in flight, mission, program, and system readiness reviews to ascertain systems are ready to support missions, programs, flights, and operational users.

q. Implement an effective risk management approach to include continuous assessment of what could go wrong, determining what risks are important to address, and implementing risk mitigation strategies that are reasonable and commensurate with the probable adverse effects should a risk occur.
   1) This approach shall be consistent with the NPG 7120.5.
   2) At the core of this approach is the assignment of risk management responsibilities to the appropriate management level, where there is direct professional involvement and concern over the impact of risks and where identification, mitigation, and reporting activities become an integral component of the contractor's project management planning, budgeting, and execution.
   3) The contractor shall utilize management tools, actively participate in recurring risk management meetings, and coordinate with the CIO and customer in the execution of its responsibilities.
   4) The contractor shall provide the Risk Management Plan, Analysis, and Tracking Reports in accordance with DRD 974MA-002.

## 2.2    STRATEGIC PLANNING AND TECHNOLOGY EVALUATION

The contractor shall perform systems analysis and planning activities for IT systems. In performance of this function, the contractor shall:

a. Review and assess the future direction of and developments in IT to ensure architectures and management structures under this contract evolve to take advantage of new product releases (hardware and software), IT innovations, and advances in technology and to retire technologies that are no longer cost effective to operate and maintain.

b. Evaluate potential equipment and technologies to determine functionality, feasibility, and merit. Utilize modeling, hands-on testing, market surveys, prototyping and pathfinder techniques and invite customer participation in the evaluation process.

c.  Transition new technologies and services to designated suppliers of services. Assist suppliers with integration of new technologies or services into existing infrastructures.

d.  Maintain and update Agency information systems architectures for networks (including teleconferencing services), computers, applications, and data administration, and ensure conformance with evolving IT standards and guidelines (DRD 974MA-007). Maintain and update MSFC information systems architecture for computers, applications, and data administration (DRD 974MA-007). Ensure conformance with IT standards and guidelines.

e.  Develop and document information resources strategic/implementation plans for the services and supporting systems in accordance with DRD 974MA-007. These plans will establish the direction of change based on evolving technologies and customer requirements.

f.  Perform trend analyses of computer workloads, software utilization, network utilization (including teleconferencing services), and hardware and software problems (DRD 974MA-007).

g.  Conduct and report the results of COTR-directed special studies that include the development of business cases, hypothetical investigations, benchmarks, standards migration, pricing, and trade studies in accordance with DRD 974MA-007.

h.  Prepare and maintain a portfolio of major information systems that monitors investments and prevents redundancy of existing or shared IT capabilities in accordance with DRD 974MA-003. The portfolio shall provide information demonstrating the impact of alternative IT investment strategies and funding levels, identify opportunities for sharing resources, and consider the agency's inventory of information resources.

i.  Introduce new technologies into the infrastructure that enhance the efficiency or quality of the services to meet user requirements. The contractor shall support tasks related to improving and integrating enhanced services into the operational architecture. These include, but are not limited to:

1)  Prototyping of services in a near-operational environment. This activity shall include maintaining a working knowledge of how current services are provided and collaboration with the service provider(s).

2)  Operating the associated network technology laboratories and the consolidation of laboratory resources. This activity shall include asset management, system testing, protocols/standards evaluation, customer requirements documentation and analysis, and technology investigation.

3)  Providing network prototyping activities including assistance in the management and operation of prototype networks.

4)  Coordination with the NASA Research and Education Network (NREN) relating to technology projects and introduction into the operational network.

5) Evaluating impacts of service implementation to the current operational infrastructure, IT security, and existing operational processes.

6) Determining the feasibility of services within the community (DRD 974MA-007).

7) Determining standards for the implementation and feasibility of incorporating new services across the Agency and within MSFC.

8) Preparing business cases evaluating the feasibility of incorporating new services (DRD 974MA-007).

9) Participating in standards and forum boards to influence next generation standards and technology direction.

10) Developing and maintaining a website to serve as a technology repository.

11) Developing and maintaining a Five Year Technology Plan in accordance with DRD 974MA-007.

## 2.3 FINANCIAL MANAGEMENT

The contractor shall be responsible for planning, tracking, accumulating, and reporting contract costs and providing other financial support required to meet the budgeting, cost reporting, billing, and disclosure requirements of the contract. In performance of this function, the contractor shall:

a. Implement and maintain a cost accounting system as part of the MICS (DRD 974MA-006). The system shall be fully integrated across all business areas, including the contractor's procurement process, providing committed, obligated, accrued and actual costs. The system shall interface with IFM. The system shall be structured to provide projections and tracking of negotiated, accrued and actual costs by individual cost elements (including labor hours) and by WBS elements at any level, major functional category, specific project number, specific service order number, NASA organization that the project is funded through, end-user organization, geographic location (including state and congressional district), specified time frame, IT and non-IT categories, and prime versus subcontracted work activities.

b. Provide cost reports in accordance with DRD 974MA-008.

c. Prepare and submit the financial management reports as listed in DRD 974MA-005.

d. Provide input data to the NASA Program Operating Plan (POP) process. These data shall incorporate annual requirements projections.

## 2.4 CONTRACT ADMINISTRATION

In performance of contract administration functions, the contractor shall:

a. Provide a single point of contact with contractual obligation authority for all contract administration functions and activities required in performance

of this contract. This point of contact shall have access to all contract administration data and information related to performance of this contract.

b. Provide on-line access to the contract administration information and data through the MICS to the CO and designated personnel. The MICS shall provide the capability to track costs by specific contract change orders. Also, the MICS shall provide manpower data including contract totals by department, location, and WBS elements (DRD 974MA-006).

c. Provide a list, as well as on-line access through the MICS, of all contractor employees working under this contract and their designated locations in accordance with DRD 974CD-002.

d. Be responsible for generating, editing, merging, maintaining, and distributing documentation related to the performance of this contract (See DRD 974MA-007). Documentation includes documents, storage media, and records. The contractor shall:

1) Provide, implement, and maintain an on-line documentation management system in accordance with NPD 1440.6.

2) Provide access to CO- and COTR-designated personnel.

3) Maintain an initial set of documentation and drawings that was generated under previous contracts related to the work described in this PWS (DRD 974MA-007).

4) Retain and maintain all documentation and drawings generated under this contract (DRD 974MA-007).

5) Prepare and maintain a Documentation Tree that categorizes, lists, and describes all such documentation in accordance with DRD 974MA-007.

6) Prepare and submit documents for CIO-sponsored user meetings and committees, and provide support for follow-up documentation for these meetings.

7) The contractor shall provide the documentation required by this PWS as well as the documentation described in the Data Procurement Document (DPD 974).

## 2.5 PROCUREMENT

In performance of this contract, the contractor shall:

a. Implement and maintain a procurement information system as part of the MICS (DRD 974MA-006). The system shall track the status of individual procurements, whether initiated by the Service Request System (SRS) or other means, from purchase request through final purchase order, delivery, and acceptance and provide appropriate information to the IFM system. The system shall provide for on-line funding verification of purchase requests prior to initiation of purchase orders.

b. Provide, implement, and maintain procurement controls including: contractor policies and procedures governing standards of conduct,

procurement processes and practices, and prevention of waste, fraud, and mismanagement (DRD 974MA-006).

c. Provide all supplies, materials, and services (not otherwise furnished by the Government) required to perform the services and functions specified in the PWS and to accomplish the UNITeS mission.

d. Provide replacement parts or equipment, spare parts, temporary labor services, vendor maintenance agreements, software subscription services, hardware engineering changes or updates, IT-related supplies and special general-purpose software packages necessary to perform the operations and maintenance functions of this contract.

e. Provide hardware upgrades; systems and applications software licenses, renewals, and enhancements; services and maintenance, including utilizing Agencywide or government-wide contracts or site software license agreements, for the systems for which the contractor is designated Systems Manager.

f. Facilitate payments to other contractors and suppliers in support of customer agreements including international and other government agencies.

## 2.6 ASSET MANAGEMENT

The contractor shall be responsible for the official accountable record keeping, physical inventory, financial control and reporting of all government property for which the contractor has been given responsibility (DRD 974MA-007). The contractor shall provide a Government Property Management Plan in accordance with DRD 974LS-001. The contractor is also responsible for shipment of property as required to support service delivery.

## 2.7 SECURITY

The contractor shall implement a comprehensive security program consistent with applicable NASA, DOD, MSFC, and GSFC regulations and procedures for the performance of the UNITeS mission. The contractor's security program shall provide an approach that is functionally able to address end-to-end security planning, issues, and incidents for MSFC and Agency supported systems. The program shall also represent an integrated approach to security planning for all IT areas, including desktop, server, and network components.

The program shall encompass, at a minimum, the following functional areas: telecommunications security functions, an IT Security Program, and disaster preparedness and recovery.

### 2.7.1 Telecommunications Security

The contractor shall support customer and program requirements for classified Communications Security (COMSEC) and unclassified security. In performance of this function, the contractor shall:

a.  Maintain and administer a NASA COMSEC account through the TOP SECRET/Sensitive Compartmented Information LEVEL, and provide encryption key management services, and classified documentation storage.
b.  Provide encryption key management services, and store sensitive documentation for teleconferencing and data circuits.
c.  Operate and maintain secure communications equipment to include voice, data, and video equipment.
d.  Provide support for NASA National Security Systems.

## 2.7.2    IT Security Program

The contractor shall prepare an Information Technology Security Plan that documents how the contractor and subcontractor personnel will utilize, in a secure manner commensurate with sensitivity of the information involved, those Federal computer systems and software applications managed by others. The contractor shall adhere to all NASA policies and procedures when utilizing corporate resources within the NASA environment. The contractor shall prepare a system-level Information Technology System Security Plan for each Federal general support computer system and major software application managed by contractor and subcontractor personnel in the performance of the contract. The security plan(s) shall be based on an assessment of risks and document the safeguards necessary to ensure sufficient electronic information availability, integrity, and confidentiality as required by NPG 2810.1 and NIST standards. The contractor shall prepare the information technology security plan(s) in accordance with DRD 974CD-001.

## 2.7.3    Continuity of Services and Operations

The contractor shall develop, maintain, and test service continuity, contingency, and disaster recovery plans for all systems for which they are responsible. In support of disaster preparedness and recovery, the contractor shall:

a.  Develop and maintain a Disaster Recovery Plan (DRD 974MA-007) to ensure the orderly recovery from a disaster that may render all or part of information facilities, systems, and equipment inoperable. This plan shall be in accordance with applicable NASA policy (NPG 1040).
b.  Coordinate with information systems and disaster recovery experts across MSFC and NASA to verify integration of procedures and planning techniques.
c.  Execute effective measures to protect all systems equipment and data from potential environmental threats.
d.  After the occurrence of a disaster, ensure that systems are operational and restore any lost capabilities and data.
e.  Develop and maintain a Business Continuity Plan in accordance with DRD 974MA-007.

### 2.7.4    Emergency Response

The contractor shall provide necessary materials, equipment, and emergency essential personnel in support of the Emergency Operations Center and the Marshall Emergency Plan (MPG 1040.3H). The contractor shall also develop and maintain Business Continuity Plans and Disaster Recovery Plans for all systems for which they are responsible in accordance with DRD 974MA-007.

### 2.7.5    Audit/Investigation Support

The contractor shall provide support and information to internal and external auditing and investigations performed by agencies such as General Accounting Office (GAO), Inspector General (IG), Defense Contracting Audit Agency (DCAA), Defense Contract Management Agency (DCMA), Federal Bureau of Investigation (FBI), Office of Management and Budget (OMB), independent boards, and other requests.

### 2.7.6    Export Control

The contractor shall prepare, implement, and maintain the Export Control Plan in accordance with DRD 974MA-009 and implement a comprehensive program consistent with applicable NASA, MSFC, Department of State, and Department of Commerce regulations and procedures for the performance of the UNITeS mission. The contractor shall comply with NASA FAR Supplement 1852.225-70, NPD 2190.1, MPD 2190.1, and MPG 2190.1.

The contractor shall provide a monthly report of all export control activities in accordance with DRD 974MA-009. The contractor shall maintain a database recording export control activities. The database shall be accessible to contractor and NASA personnel as designated by the COTR.

### 2.7.7    System Administrator Certification

In addition to any other requirements of this contract, all individuals who perform tasks as a system administrator or have authority to perform tasks normally performed by system administrator shall be required to demonstrate knowledge appropriate to those tasks. This demonstration, referred to as the NASA System Administrator Security Certification, is a NASA funded two-tier assessment to verify that system administrators are able to:

    a.  Demonstrate knowledge in system administration for the operating systems for which they have responsibility.

    b.  Demonstrate knowledge in the understanding and application of Network and Internet Security.

Certification is granted upon achieving a score above the certification level on both an Operating System test and the Network and Internet Security Test. The Certification earned under this process will be valid for three years. The NASA Chief

Information Officer has established the criteria for this skills assessment. The objectives and procedures for this certification can be obtained by contacting the IT Security Awareness and Training Center at (216) 433-2063.

A system administrator is one who provides IT services, network services, files storage, or web services to someone else other than themselves and takes or assumes the responsibility for the security and administrative controls of that service or machine. A lead system administrator has responsibility for IT security for multiple computers or network devises represented within a system; ensuring all devices assigned to them are kept in a secure configuration (patched/mitigated); and ensuring that all other system administrators under their lead understand and perform IT security duties. An individual who has full access or arbitrative rights on a system or machine that is only servicing themselves does not constitute a "system administrator" since they are only providing or accepting responsibility for their system. Individuals that are only servicing themselves are not required to obtain a System Administrator Certification.

## 2.8    SAFETY

The contractor shall establish and implement an industrial safety, health, and environmental program and provide a Safety and Health Plan in accordance with DRD 974SA-001. The contractor's industrial safety, health, and environmental program shall incorporate the following Safety and Health Program Core Process Requirement (CPR) elements documented in MPG 8715.1:

    a.  Management commitment and employee involvement in the safety and health program.
    b.  System and worksite hazard analysis.
    c.  Hazard prevention and control.
    d.  Safety and health training.
    e.  Environmental compliance.

The contractor shall report mishaps and safety statistics in accordance with DRD 974SA-002.

## 2.9    FACILITIES MANAGEMENT

The contractor shall implement and maintain a uniform system of managing the use of assigned facilities. In performance of this function, the contractor shall:

    a.  Maintain documentation as a basis for requesting and recommending additional space and reallocation of assigned space or interior partitions (DRD 974MA-007).
    b.  Maintain floor plans of all assigned facilities, including local MSFC-resident and remote Centers and gateways, to reflect the location of furniture, equipment, telephones, environmental systems and electrical services in equipment areas (DRD 974MA-007).

c. Maintain continuous records of changes or movements of equipment, furniture, and telephones to ensure that accountability requirements for all equipment and systems are met (DRD 974MA-007).

d. Maintain in the MICS continuous records of changes or movements of personnel providing this information on-line for COTR designated personnel review (DRD 974MA-007).

e. Maintain location information in the MICS including number of personnel by location, square footage, and associated lease and maintenance costs (DRD 974MA-007).

f. Review and assess MSFC Facilities Office planning activities for impact on CIO systems and provide comments to designs and shop drawings on MSFC Form 1540 (DRD 974MA-007).

g. Plan for future facility requirements or expected changes in personnel and equipment locations.

h. Support facility modifications to accommodate personnel space change requirements and new equipment at specified locations scheduling this activity to minimize disruption of daily operations (DRD 974MA-007).

i. Obtain approval from the cognizant NASA Facilities Offices before performing any facilities activities at a NASA installation.

j. Track in the MICS the schedule and status information for facilities work requests and facilities projects that affect IT service delivery (DRD 974MA-007).

k. Define and document environmental requirements to accommodate equipment (DRD 974MA-007).

l. Develop and maintain memoranda of agreement between MSFC and host center/facilities to document requirements to house UNITeS systems and personnel (DRD 974MA-007).

## 2.10    QUALITY ASSURANCE

The contractor's quality system shall be compliant to ANSI/ISO/ASQC Q9001-2000. The contractor may satisfy this requirement by current registration by a recognized registrar and/or by MSFC audit of their system. The contractor shall detail their planned quality controls for the product being procured and their quality system controls in a quality section in accordance with DRD 974MA-001.

If the contractor operates to or uses MSFC procedures, the contractor shall support the MSFC ISO registration process for these procedures.

## 2.11    CUSTOMER RELATIONSHIP

The contractor shall partner with NASA to perform the following customer relation functions across all services.

## 2.11.1    Customer Requirements Planning

The contractor shall provide the necessary planning in support of customer requirements.  In performance of this function, the contractor shall:

a. Document all customer requirements as received.
b. Formally solicit, gather, and document customer requirements in accordance with DRD 974MA-007.
c. Identify resources necessary to accomplish requirements.
d. Provide a single point of contact to plan and coordinate services to support special events.

## 2.11.2    Customer Interface

The contractor shall interface with customers and coordinate the IT service activities with COTR-designated personnel.  The contractor shall be responsible for understanding the informational requirements of the customer.  In performance of this function, the contractor shall:

a. Serve as an IT point of contact and assist the NASA IT points of contact for IT support and services, and aid in tracking and prioritizing user requirements (DRD 974MA-007).
b. Access, interrogate, display, and retrieve information related to user service requests, problems, operational status of systems, service performance, and cost and usage reports.
c. Assist Office of the CIO service owners, NASA IT points of contact, and the customers in the development of requirements for new programs and projects.
d. Provide assessments to the customer and the NASA IT points of contact of any impacts caused by changes to requirements (DRD 974MA-007).
e. Inform customers of available IT services and standards.
f. Coordinate with the NASA IT points of contact to provide cost estimates to customers.
g. Identify, collect, summarize, and present data on customer satisfaction within each customer service area (DRD 974MA-006).
h. Assist the NASA IT points of contact and customers with IT resource procurements.
i. Assist the NASA IT points of contact and the Office of the CIO service owners in developing and managing customer service level agreements and commitment agreements (DRD 974MA-007).
j. Coordinate and support user conferences, meetings, and training with customers and COTR-designated personnel.
k. Serve as focal point for WAN Center Representatives and programs located across the Agency.
l. Maintain and distribute documentation to provide customers with service and process information.

### 2.11.3 Customer Satisfaction Survey

The contractor shall perform customer satisfaction surveys. These surveys shall be automatically distributed to the customer when every service request is completed and at least once a quarter to a random sample of 20% of closed trouble tickets. Customer satisfaction attributes to be measured include, but are not limited to: responsiveness, communications, professionalism, knowledge, ease of use of the service request system, and satisfaction with the trouble resolution process. The contractor shall capture and compile the responses in an online database. The contractor shall summarize the number of surveys sent, responses received, action taken, and results in accordance with DRD 974MA-006. The COTR and designated personnel shall be provided access to the online database. In addition, customer satisfaction shall be solicited and assessed on a yearly basis for major IT projects.

## 2.12 APPROACHES AND INNOVATIONS

The contractor shall provide the approaches and innovations listed in Appendix C. The contractor shall report status on each approach and innovation in the monthly program management reviews.

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# 3. AGENCYWIDE INFORMATION SERVICES

The Agencywide Information Services include those requirements that service the Agency customer base. This includes applications software, digital television, IT security, National Security Systems, data center, Russia IT services and wide area network services. The contractor shall measure and report the service-level objectives and performance for each of the services defined in this PWS in accordance with DRD 974MA-010. The contractor shall maintain and publish an integrated project schedule documenting all major Agencywide Information Services milestones and project inter-relationships.

## 3.1 AGENCYWIDE APPLICATION PROJECTS

The contractor shall provide computer application services for Agencywide customers. These services shall include application development, sustaining support and production support in compliance with established architecture standards. The applications descriptions shall be maintained in the Applications and Web Services Manual (DRD 974MA-007).

Application development and sustaining support includes definition and specification, requirements analysis and feasibility studies, design and development, configuration management, user assistance and training, documentation, ongoing maintenance (repairs and upgrades), other operational support, and replacement or retirement. For COTS applications, this support includes evaluation, procurement, installation, integration, testing, training, user assistance, administration and other operational support. This service also includes application-related consulting, subject matter technical experts, and technical management. Support is also provided to the Software AG products Database Administration/Applications Working Group, as well as evaluation and installation of the Software AG product releases to the Agency.

Production support, which is part of the operational support, includes data preparation, data entry, initiation and monitoring of production programs, user assistance, and generation, review and distribution of reports.

The contractor shall perform Data Administration (DA) in the planning, organization, design, control, and documentation of data resources for all Agency-supported systems. In performance of this function, the contractor shall:

a. Establish and implement consistent overall DA strategies, such as data definition, logical data modeling, data resource life cycle management, data security, data integrity, and quality assurance.
b. Establish, implement, and maintain a DA program that incorporates the following subelements: DA policies, procedures and standards, data architecture, data dictionary and models, orientation and training, and quality assurance (DRD 974MA-007).

### 3.1.1 Sustaining Engineering Support for Agencywide Administrative Systems (SESAAS)

The contractor shall maintain the SESAAS applications until transition to the IFMP suite of applications. Prior to the transition, the contractor shall also develop any interfaces required between these Agencywide systems and the IFMP system. These applications include:

    a. Procurement System - Acquisition Management System (AMS).
    b. Asset Management – NASA Equipment Management System (NEMS), NEMS Central Database system, NASA Property Disposal Management System (NPDMS), NASA Supply Management System (NSMS), and NASA Online Supply Catalog (NOSC).
    c. Human Resources – NASA Personnel/Payroll System (NPPS) and Consolidated Agencywide Personnel/Payroll System (CAPPS).
    d. Training –The contractor shall be responsible for the development and maintenance of the AdminSTAR system. The contractor shall also develop any Agencywide ad hoc queries using Brio. The contractor shall also be responsible for the software development and sustaining support for the NASA On-line Registration System (NORS), which interfaces to AdminSTAR.

The contractor shall also provide production support to the NEMS Central Database, the General Services Administration (GSA) Error Report Transmission, Employee Express, CAPPS, and AdminSTAR.

### 3.1.2 Consolidated NPPS Operational Support

The contractor shall provide production support and various system administration services for the Consolidated NPPS in support of the Consolidated Payroll Office located at MSFC. In providing this service, the contractor shall provide production support to process the bi-weekly payroll, generation of payroll reports, functional support for verification of payroll reports, generation of W-2 forms for the Agency, and development of special software routines for special reporting requirements. The following activities shall be provided:

    a. Manage all programs, files and databases to ensure security and integrity.
    b. Evaluate screens, reports, and other computer-generated output supporting production processes.
    c. Coordinate data entry and other input activities and perform other setups for computer production processing.
    d. Collect scheduled output products, arrange the products into assembled reports, and provide final products to distribution points.
    e. Schedule work requests and perform automated scheduling of applications for daily production processes.

f. Collect user schedules, resolve schedule conflicts, prepare monthly projections of computer time requirements, and issue product schedules in response to customer inputs (DRD 974MA-006).

g. Provide an interface among the user community, computer operations, and programmers for requirements satisfaction and problem resolution.

h. Control access to computer programs, databases and libraries.

### 3.1.3 Site for On-line Learning and Resources (SOLAR)

The contractor shall provide software development; sustaining support; system and database administration; production support; and course content development for the SOLAR system. Course content development shall meet Federal Accessibility Standards compliance as well as Sharable Content Object Reference Model (SCORM) compliance. Examples of course content are IT Security training, IFMP training, and Safety and Mission Assurance training.

### 3.1.4 Web Time and Attendance Distribution System (WebTADS)

The contractor shall provide software development and sustaining support as well as production support activities for the WebTADS.

### 3.1.5 NASA Acquisition Internet Services (NAIS)

The contractor shall provide software development and sustaining support as well as production support activities for the NAIS.

### 3.1.6 Dryden Flight Research Center (DFRC) Applications Support

The contractor shall provide sustaining and production support for the DFRC applications until transition to the IFMP suite of applications. This responsibility shall include the installation of the core Agencywide software systems and sustaining support of any site-unique changes to the core. The contractor shall provide support for the transition and for any interfaces required by those site-specific systems that will not be replaced by IFMP. The applications include:

a. Dryden Accounting and Resource Tracking System (DARTS).
b. Labor Distribution and Tracking (LABOR) System.
c. Time and Attendance and Distribution System (TADS).
d. Integrated Security Information System (ISIS).
e. NSMS site unique.
f. NEMS site unique.
g. NPDMS site unique.
h. AMS site unique.
i. NPPS site unique.

## 3.2    DIGITAL TELEVISION (DTV)

The contractor shall support the NASA DTV Project. Support to the project shall include project management, design and engineering, operations, intercenter and intracenter coordination, implementation, and sustaining engineering directly related to the DTV Project. In providing this service, the contractor shall:

a. Provide customer support, such as collecting television requirements and preparing data in appropriate formats (DRD 974MA-007).
b. Develop transition and implementation plans (DRD 974MA-007).
c. Develop a laboratory to test equipment, interfaces, and processes.
d. Provide a technical interface with vendors, broadcast, and commercial television communities.
e. Provide engineering and operation expertise for consulting on distribution of audio and video between NASA Centers, within the centers, and to the media.
f. Coordinate Agency DTV implementation.
g. Coordinate, organize, and participate in technical working groups.
h. Support DTV flight projects.

## 3.3    IT SECURITY

The contractor shall provide IT Security services to the Agency customers. These services include maintenance of existing capabilities, development or acquisition, and implementation of enhancements. In providing these services, the contractor shall:

a. Utilize NASA's IT and wide area network capabilities to perform the support functions at all field centers and Headquarters.
b. Ensure that all IT resources and components are secured to minimum requirements in accordance with NPG 2810.1 and shall react to deal with any vulnerabilities or security incidents that might occur. This includes threat notification responses, risk management, network monitoring, centralized database collections, security response tracking and analysis, and forensics of IT Security activities. The contractor shall work closely with the NASA Center IT Security Managers or their representatives at all Centers.
c. Establish and maintain contact with internal and external technical working groups to include IT and IT security professional associations, NASA field centers, vendors, other government agencies, and national/international industry organizations.
d. Evaluate, develop, and test prototypes of IT security tools, techniques, and training.
e. Recommend, assist as needed in design, implement and maintain a firewall architecture/design that meets the NASA IT Security standards for perimeter architecture and Agencywide projects and networks.
f. Ensure that all personnel associated with IT security have a minimum of a final Secret Security clearance or higher.

g. Establish and maintain an Agency IT Security Program and Response Center.
h. Conduct yearly IT Security risk assessments of Agency systems and services, in accordance with NPG 2810.1.
i. Develop, implement and maintain a database to collect information on hostile probes throughout the Agency. Provide reports for trending analysis (DRD 974MA-006).

### 3.3.1     Intrusion Detection/Incident Response

The contractor shall provide early warning and detection of intrusions into the NASA wide area network through analysis of network traffic from IP Networks, including the Internet and key signatures associated with known vulnerabilities and cyber attacks. The contractor shall provide the response mechanism to contain, analyze and report on the number, source and nature of hostile probes coming from the networks, which includes the Internet. The contractor shall analyze and be able to project evolving situations based on data collected from contractor-managed networked and monitoring devices, as well as NASA-managed networked and monitoring devices. The contractor shall support NASA incident investigations. The contractor shall provide monthly reports on the nature of the NASA traffic passing through the NASA connections to any connections between NASA and its partners even if they are utilizing NASA address space, including Internet connections (DRD 974MA-006). The contractor shall support the deployment of network monitoring devices which would include the installation of network taps as required by NASA and the deployment of monitoring devices and data gathering systems to be housed in the contractor network and communications space as provide under or acquired through this contract.

### 3.3.2     NASA National Security Systems

The contractor shall provide support for secure intra- and inter-Agency communications within the Government that are necessary to improve distribution of threat information and coordination of disaster response. This shall include the provisioning, maintenance, and utilization of the NASA Secure Network and other National Security Systems.

The contractor shall install, maintain, and prepare designs for and operate the systems associated with the National Security systems. However, due to the nature of the classification and accreditation of these U.S. Government systems, any activity in this regard will require the Agency's approval before proceeding.

### 3.3.3     NASA Secure Sensitive but Unclassified Networks

The contractor shall support the deployment and operation of network encryption services such as VPN or point-to-point solutions. The contractor shall provide recommendations on how to support out of band management of IT security monitoring, data analysis engines firewall and VPN services and the operations and maintenance for such devices.

### 3.3.4    IT Security Perimeter

The contractor shall provide support to implement and maintain a consistent IT security perimeter. In providing this service, the contractor shall:

a. Provide a phased approach toward centralized operations of a security perimeter with respect to firewalls and intrusion detection systems. The contractor shall provide a secure NASA WAN perimeter that includes monitoring, firewall and DOS services for NASA at each peering point.
b. Develop and maintain a Demilitarized Zone (DMZ) design consistent with the Agencywide architecture and environment in support of Agencywide projects and collaboration (DRD 974MA-007). Monitor the traffic passing into and out of the perimeters of each Center and provide an analysis of the nature of the traffic showing what types of services are being used, the volume of traffic associated with the services, how connections are made, and their identity.
c. Deploy and operate network encryption services such as VPN or point-to-point solutions. The contractor shall provide recommendations on how to support out of band management of IT security monitoring, data analysis engines, firewall and VPN services and the operations and maintenance for such devices.

### 3.3.5    Secure Authentication Service

The contractor shall operate and maintain a secure authentication service. In providing this service, the contractor shall:

a. Create, issue, and manage smart card authentication and secure tokens. Maintain records in accordance with DRD 974MA-007.
b. Provide smart card administration for the Agency.
c. Maintain and operate the secure authentication infrastructure.
d. Coordinate in a seamless fashion with the appropriate security services organizations regarding smart card administration.
e. Integrate Agencywide applications with the smart card.

### 3.4    DATA CENTER SERVICES

The contractor shall provide the data center services that centrally manage computer systems and computer operations for the Agency. MSFC is delegated project management responsibility for the NASA ADP Consolidation Center (NACC), a centralized mainframe capability, and for other Agencywide midrange/server systems. The data center shall provide the following for the Agency and its customers:

a. Consolidation and centralization of various NASA center workloads onto fewer mainframe and midrange/server platforms and operating environments that are standard in nature.

b. Licensing of commercial-off-the-shelf (COTS) software products for NASA Center and Agency workload requirements (DRD 974MA-007).
c. Provision and maintenance of computer systems, data systems, and operations managed at the facility for access by Agency end users.
d. Provision of network services for access to systems supported by the facility.
e. Interfacing with the IFMP and other Agency applications.

The contractor shall adhere to NASA mission freeze policies. These policies disallow changes during mission-critical periods. The contractor shall follow the NASA freeze exemption request and approval process.

### 3.4.1 Consolidation and Centralization Services

The contractor shall support the consolidated, centralized and standardized management of various NASA Center workloads. These workloads currently execute on IBM-compatible mainframes and mid-range servers. Consolidation services shall include the planning, testing, and installation of computer systems hardware, as necessary, to support various NASA Center and Agency workloads at the data center; planning, testing, and installation of COTS software, including operating systems and subsystem component software and various COTS applications software required by data center-supported systems; consolidation of support services, such as licensing management, capacity planning, and chargeback; consolidation of technical support functions, such as data base administration account management; and systems security, and consolidation of customer support functions, such as service level agreement compliance, metrics, and change management. In providing these services, the contractor shall:

a. Interface with other NASA Center personnel to plan and coordinate consolidation and standardization activities.
b. Provide problem tracking and resolution services for consolidated or centrally managed systems.
c. Plan, engineer, integrate, and implement new capabilities and features to optimize and standardize workloads, meet customer requirements, and accommodate changes in technology.

### 3.4.2 Computer Systems Services

The contractor shall provide computer systems services to support NASA customer applications. Computer systems services encompass the following: providing and maintaining operating systems, data base management systems, and COTS applications software; providing hardware and software systems and maintenance; providing technical assistance; operating computer systems; and acquiring and implementing COTS products and systems. In providing these services, the contractor shall:

a. Provide hardware and systems software enhancements to meet NASA customers' performance requirements in response to changing workloads and technologies.
b. Provide and maintain operating systems, data bases and data base management systems, compilers, libraries, and all other systems software necessary for the operation, execution and security of the computer and communications systems.
c. Operate and maintain computer processing, peripheral, and communications systems and servers, to include monitoring, system initializations and recoveries, and storage management for production systems located at MSFC and at NASA Centers. The systems shall be operated 24 hours per day, 7 days per week.
d. Provide change control and configuration management, risk management, standard backups and disaster recovery planning for all systems.
e. Provide systems administration and security support, such as program/data/systems security, scheduling, quality control, user access to data center resources, account management and chargeback.
f. Provide production control and job scheduling support for all data center systems. This includes monitoring and problem notification for all scheduled backups and problems with COTS products.
g. Measure and report computer systems performance, throughput, and capacity information (DRD 974MA-006).
h. Provide planned versus actual utilization by customer (DRD 974MA-006).

### 3.4.3 Network Services

The contractor shall provide network engineering, planning and support services for the data center systems. These services include maintenance of existing capabilities, development or acquisition of enhancements, and implementation of enhancements. In providing these services, the contractor shall:

a. Provide network services that meet the customers' performance, security and redundancy requirements.
b. Integrate network services support required by the data center and its customers with other wide area and local area network service providers.
c. Provide and maintain the front-end processors and channel extenders located at the NASA remote sites.
d. Measure and report network performance and capacity information for network elements within their management requirements (DRD 974MA-006).

### 3.4.4 Agencywide Midrange Services

The contractor shall provide Agencywide computer systems services identified in Appendix A, Category I. These services shall include operation/maintenance of existing systems, acquisition/implementation of COTS products, database administration, and development of unique systems in compliance

with established architecture standards. The system configuration documentation shall be maintained in the online Midrange Node Book (DRD 974MA-007). In providing these services, the contractor shall:

   a. Provide hardware and systems software enhancements to meet customers' requirements in response to changing workloads and technologies.
   b. Provide and maintain operating systems, database management systems, web server systems, electronic mail and distribution services, thin client software, compilers, libraries, and all other systems software necessary for the operation, execution and security of the computer and communications systems.
   c. Operate and maintain computer, peripheral, data acquisition, and communications systems, to include system initializations and recoveries, storage management, and print production and dissemination.
   d. Provide system administration such as program and data security, scheduling, and quality control.
   e. Provide security support that adheres to new security bulletins and installation of patches to fix known vulnerabilities and works within restrictions involving firewalls and other security-related constructs, maintaining compliance with NASIRC bulletins, utilizing Secure Shell for host authentication, user authentication, and encryption, and the use of TCP/IP wrappers and system monitoring for anomalies and security break-in attempts.
   f. Provide management of users to include: addition and deletion of userids, disk quotas, accounting and access control, utilization reports, consultation on advancing technologies, video and imaging support and data visualization (DRD 974MA-006 and DRD 974MA-007).
   g. Provide backups and restoration of the systems including all system files, file systems, directories, and/or user files.

## 3.5      RUSSIA IT SERVICES

The contractor shall provide telecommunications and IT services for approved NASA Program and Project requirements in Russia. These services include: coordination, engineering, acquisition of enhancements, and implementation of IT equipment and software. The infrastructure in Russia consists of basic telecommunications and end-user IT services that are capable of delivering video, voice, data and mission operations support. The infrastructure shall be modular and scalable in design in order to be expanded, changed and/or upgraded as requirements dictate.

### 3.5.1     Russian Wide Area Network (WAN)

The contractor shall provide WAN connectivity, equipment, and operational support at designated locations in Russia. The contractor shall ensure interoperability of Russian services with domestic services. These services shall include:

a. Centralized hub at Telecom Center for distribution/processing of all telecommunications between NASA networks and the designated locations in Russia.
b. Dedicated (mission) voice loops to designated locations in Russia and in the United States.
c. Switched Voice services between the MSFC telephone system, JSC telephone system, and designated locations in Russia; local and long distance voice traffic shall be directed to the Public Switched Telephone Network (PSTN) from the MSFC and JSC telephone systems.
d. Routed (mission) data services consistent with mission-critical routed data service requirements in section 3.6.5.1.
e. Routed (administrative) data services consistent with standard and premium routed data service requirements in section 3.6.5.1.
f. Video Teleconferencing (ViTS) services consistent with section 3.6.3.1.
g. Portable video teleconferencing services consistent with section 3.6.3.3.
h. Facsimile service consistent with section 5.4.2.
i. Provide Voice over IP (VoIP) services between MSFC and Moscow.

### 3.5.2 Russian Local Area Network (LAN)

The contractor shall provide LAN support at designated locations in Russia. The contractor shall provide the services in conformance with NASA standards and policies and ensure interoperability with corresponding systems at the NASA Centers. These services shall include:

a. Electronic Mail/SMTP Gateway.
b. Anti-Virus Protection.
c. Manual Procedure Viewer (MPV).
d. Internet Access/SMTP Gateway.
e. Domain Name Services (DNS).
f. Data Transport (Telnet/FTP).
g. Data Storage/Retrieval.
h. Backup and recovery systems.

### 3.5.3 Russian IT Security

The contractor shall provide IT security functions for Russian services consistent with requirements in section 5.5. Services specific to Russia shall include firewall management, network metrics, web trending reporting, and incident response (DRD 974MA-006). The contractor shall provide encryption technology according to U.S. Export laws and Russian telecommunication laws.

### 3.5.4 Russian End User Support

The contractor shall provide end user support at designated locations in Russia. These services shall include sustaining software versions consistent with Agency standards and maintaining compatibility with vendors. These services shall include:

a. Desktop Workstations.
b. Laptops.
c. Printers.
d. Telephones.
e. Conference Room Services.

### 3.6 WIDE AREA NETWORK (WAN) SERVICES

MSFC is delegated responsibility for Wide Area Network (WAN) services, with matrixed civil service support provided by the Goddard Space Flight Center (GSFC) and other NASA Centers. The WAN services are provided via the NASA Integrated Services Network (NISN), as well as other prototype and secure networks. The WAN provides telecommunications services for transmission of data, video and voice for NASA Enterprises, Programs, Projects, and Centers. The contractor shall be responsible for providing the services and supporting functions described below. Services include voice and video teleconferencing, switched voice and data, video distribution, mission voice, routed data, dedicated data, high rate video/data, and custom telecommunications services. The WAN provides these services at, and between, NASA centers, spacecraft operations and control centers, data archive facilities, and tracking stations. Locations also include international partners, academia, other government agencies, and contractors.

The contractor shall provide all WAN services in accordance with NASA architectural standards and as specified in performance requirements documents.

### 3.6.1 GSA Contract Integration

For WAN services, NASA will utilize the General Services Administration (GSA) contracts when those contracts meet NASA's requirements or can be modified to meet NASA's requirements. The contractor shall be responsible for matching customer requirements to GSA solutions, for interfacing to GSA services and providers, and for processing and disseminating billing information (DRD 974MA-006). The contractor shall develop network designs and operations concepts, and NASA will approve the designs/concept and contract with GSA vendors to provide the services. The contractor shall support NASA in generating and tracking GSA service orders. Information on the GSA/FTS2001 service offerings is available at http://www.fts.gsa.gov. NASA may also use other government contract vehicles to purchase WAN services when these alternatives prove advantageous to the government.

## 3.6.2 Switched Voice Services

Switched voice services include domestic and international long distance service from the desktop, calling cards held by individuals, and toll-free in-bound services. These services shall be provided to all NASA centers, Headquarters, JPL, and to other NASA facilities and contractor locations.

## 3.6.3 Video Services

The contractor shall provide and maintain video services at and between NASA facilities and other locations. These services include video teleconferencing and customized video distribution services.

### 3.6.3.1 Video Teleconferencing Service (ViTS)

The contractor shall provide and maintain a video teleconferencing service with the following capabilities:

a. Interactive point-to-point and multipoint conferencing.
b. Continuous viewing of participants in a multipoint conference.
c. Web-based network resources and room scheduling system including teleconferences (DRD 974MA-006).
d. Interactive graphics and document sharing in a secure environment.
e. Interoperability with current (H.320, H.323, and MPEG) and future industry video standards.
f. Integration and interoperability with GSA/FTS2001 services and other videoconferencing services such as the Defense Information Services Agency (DISA) service.
g. Interoperability between permanent and portable videoconferencing facilities.
h. Transmission and distribution of the video, audio, and graphics among the participating locations.
i. Operations of the Video Teleconferencing Center.

### 3.6.3.2 ViTS Facilities

The contractor shall design, install, and maintain video teleconferencing facilities at COTR-designated locations. This shall include:

a. Associated hardware and software systems.
b. Room layout, including coordination of facility changes (DRD 974MA-007).
c. Video projection screens or monitors.
d. Audio equipment.
e. Interactive graphics and document sharing workstation.
f. Room operations panel.

### 3.6.3.3 Portable Video Teleconferencing Facilities

The contractor shall design, install, and maintain portable video teleconferencing facilities at COTR-designated locations. The facility provision shall include:

a. Associated hardware and software systems.
b. Room layout, including coordination of facility changes (DRD 974MA-007).
c. Video projection screens or monitor.
d. Audio equipment.
e. Interactive graphics and document sharing workstation.
f. Room operations panel.

### 3.6.3.4 Video Conferencing Reservation System (VCRS)

The contractor shall operate and maintain an electronic web-based system that allows room operators and customers to reserve and view the schedules for each video teleconferencing room or system on the NASA network. The system shall at a minimum:

a. Allow users to input the desired dates, times, and rooms for a particular conference
b. Notify the user of room and system availability.
c. Schedule the conference rooms and the video services
d. Provide checks to avoid double booking of rooms and video service.

### 3.6.3.5 Room Operations

A room operator, normally employed by the host center, staffs each permanent ViTS room. The room operator schedules ViTS facilities/resources and resolves any scheduling conflicts, monitors ViTS sessions, and interacts with other room operators on the conferences to ensure the sessions go smoothly. The contractor shall provide an interface to the ViTS room operators, to include service information updates, VCRS account administration, training, periodic working sessions, solicitation and follow-up of suggestions for improving the service. At the direction of the COTR, the contractor shall provide room operators for centers who do not provide their own operators.

### 3.6.3.6 Video Distribution (Mission Video)

The contractor shall provide for the distribution of video signals in support of NASA programs. The particular implementation shall be dependent on the specific requirements of the program and may involve terrestrial or satellite transmission, with or without the utilization of digital compression and encoding techniques. Examples of current video distribution services include Shuttle External Tank Ice Video and NASA Select.

The contractor shall provide operations, sustaining engineering and maintenance of the mission video distribution system. In providing mission video, the contractor shall:

a. Operate and maintain the Goddard TV Central Facility, 8:00 am to 5:00 pm, Eastern Time, Monday through Friday, at the NASA Information Category Level of "Mission (MSN)," as defined in NPG 2810.1. During Shuttle mission support, the facility is operated 24 hours per day, 7 days per week.
b. Record, edit, duplicate, and playback video for Agency programmatic activities.
c. Provide switching and distribution of video feeds and transponder switching of NASA Select TV service.
d. Provide on-site coverage during mission critical periods.
e. Document all operations, engineering, maintenance and repair activities, including a daily log, in accordance with DRD 974MA-006.
f. Coordinate and interface with government and contractor personnel regarding mission video activities.

## 3.6.4 Voice Services

The contractor shall provide voice teleconferencing and dedicated voice services.

## 3.6.4.1 Voice Teleconferencing Services (VoTS)

The contractor shall provide voice teleconferencing services to all COTR-designated locations. The contractor shall provide multiple levels of VoTS, such as:

- Dial-out service, where an operator calls all VoTS participants at a pre-arranged time.
- Dial-in service, where participants dial into a bridge and enter a passcode.
- On-demand conferencing, where a user is either assigned a unique account and passcode that can be distributed to participants or the user may contact an operator who will dial the participants.

The contractor shall provide:

a. Operator-based and web-based reservation and scheduling function so users may reserve the resources and specify details about their conferences (DRD 974MA-006).
b. Capability for operators to monitor in-progress calls and technical support and/or monitor conference quality.
c. Capability to record and transcribe conferences if requested by the call leader.

d. Monthly VoTS usage and cost summaries by NASA center (DRD 974MA-006).
e. Secure voice teleconferencing capability to COTR-designated locations.

### 3.6.4.2 VoTS Facilities

The contractor shall design, install, and maintain voice teleconferencing facilities at COTR-designated locations. The facility provision shall include:

a. Associated hardware and software systems.
b. Room layout, including coordination of facility changes (DRD 974MA-007).
c. Audio equipment.
d. Room operations panel.

### 3.6.4.3 Dedicated (Mission) Voice Service

The contractor shall provide transmission, bridging, and switching to support a system of dedicated, mission voice circuits working in conjunction with Center switching/conferencing systems to create inter-connected voice communications loops. The voice loops interconnect the different Center voice distribution systems that support diverse missions within the Agency. The contractor shall provide operations, sustaining engineering, and maintenance of the Voice Switching System (VSS). In providing this service, the contractor shall:

a. Operate and maintain the VSS 24 hours per day, 7 days per week, at the NASA Information Category Level of "Mission (MSN)," in accordance with NPG 2810.1.
b. Operate the VSS and associated equipment in accordance with all applicable NISN Security Guidelines and Operating Procedures.
c. Provide fault isolation, restoration, testing, and monitoring, including detection of circuit degradation, of all the voice circuits terminated in the VSS.
d. Establish, maintain, and monitor voice conferences to NASA network and mission control centers and various other NASA, federal government and international partner facilities.
e. Provide on-site coverage during mission critical periods.
f. Coordinate and interface with government and contractor personnel regarding mission voice requirements-.

### 3.6.5 Data Services

The contractor shall provide routed data, dedicated data, and high rate data/video services.

### 3.6.5.1 Routed Data Services

The contractor shall provide the hardware, software, routing, management, and operations necessary to support NASA's routed data requirements. The contractor shall support Internet Protocol (IP) as the Agency's standard for routed data services and legacy non-IP protocols until they are phased out.

Four service performance categories for routed data services have been defined:

a. Real-time Critical
b. Mission Critical,
c. Premium
d. Standard

In addition to these four levels of service, the contractor shall define an approach for providing a fifth level of service categorized as "Best-effort," a lower-cost, lower-performance level of routed data service.

Performance requirements for these services are specified in the NISN Services Document, NISN 001-001 (DRD 974MA-007). Requirements that are not satisfied by these performance categories shall be provided as a custom service.

The contractor shall support several intra-domain routing protocols, including Static, Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF), and inter-domain routing protocols such as Border Gateway Protocol (BGP). The contractor shall coordinate with customers to select a protocol consistent with both the customer's requirement and the common network architecture.

The Service Demarcation Point for WAN IP Routed Data Services shall be the Local Area Network (LAN) interface of the WAN router. All NISN routers are considered WAN routers. The LAN interfaces include, but are not limited to, 10 Base T, 100 Base-TX, 100 Base FX, and Gigabit (SX, LH, ZX) Ethernet.

The contractor shall provide WAN peering to allow routed data transit and access to network providers, which are required to support Agency requirements. The peering points shall include as a minimum the following exchange points:

a. Metropolitan Area Exchange (MAE)-East
b. Next Generation Internet Exchange (NGIX)-East
c. NGIX-West
d. NGIX-Central.

In addition, there are specialized exchanges at Ames Research Center available to Federal Networks, which include:

    a. Multicast Exchange (MIX)
    b. Federal Network Exchange (FIX)
    c. IPV6 exchange development.

The contractor shall pursue or modify WAN peering as Agency requirements dictate and with coordination through the government point of contact.

### 3.6.5.2 Dedicated Data Services

Although NASA encourages the use of routed data services, the contractor shall provide full-time, dedicated bandwidth between two or more discrete locations, due to performance and/or security considerations, or to support unique data transfer protocols not otherwise supported by the routed data network. The contractor shall minimize the use of dedicated data services and encourage the use of routed data services. The contractor shall document and provide rationale for use of dedicated services. GSA contracts shall be used for the procurement of the bandwidth.

### 3.6.5.3 High Rate Data/Video

The contractor shall maintain a one-way, multi-mode/multi-channel High Rate Data System, designed for operation over a full C-band (36 MHz) domestic communications satellite transponder or equivalent terrestrial telecommunications network. This service provides a medium for transport of a Tracking and Data Relay Satellite System (TDRSS) user's digital baseband return link when the rates are 2 Mbps or higher. The system has an upper limit for the user's data of 48 Mbps. When not used for data, the service shall be used for the transmission of video information in a user's TDRSS return link from the White Sands Complex (WSC) to JSC.

### 3.6.6 International Services

The contractor shall provide international telecommunications services to facilitate communications with NASA's International Partner Agencies and their research facilities. GSA contracts shall be used for the procurement of the bandwidth. This service provides transport of data, voice, facsimile, electronic mail, and video. International services are currently provided to the following international partners: European Space Agency (ESA), Canadian Space Agency (CSA), Center National d'Etudes Spatiales (CNES), and National Space Development Agency for Japan (NASDA). The contractor shall facilitate payments to suppliers in support of agreements with international partners.

### 3.6.7 Technical Services (Dedicated)

The contractor shall provide dedicated engineering and other technical support for specific customers as designated by the COTR.

### 3.6.8 Directory Services

The contractor shall provide systems engineering and sustaining engineering support functions to support NASA's directory service. In performance of this function, the contractor shall:

a. Operate the root-level NASA directory.
b. Replicate data with all Center-level directories.
c. Update directory schemas to support new or changing application requirements.

### 3.6.9 IP Address Management

The contractor shall manage, assign, and delegate the NASA IP address space. The contractor shall coordinate with the American Registry of Internet Numbers (ARIN) for registration of NASA's networks and IP management policies.

### 3.6.10 Facsimile Broadcast Service

Facsimile broadcast provides the capability for NASA users to send a document to multiple recipients, as established on a preset distribution list, via a single transmission. In providing this service, the contractor shall:

a. Establish and maintain user accounts.
b. Assist users in building and modifying distribution lists.
c. Report performance and utilization metrics (DRD 974MA-006).

### 3.7 SYSTEMS MANAGEMENT AND OPERATIONS

The contractor shall provide network scheduling, network monitoring, network control and system management, problem management, WAN operational support, and control centers in support of the services described in this PWS. Systems Management and Operations functions provided in support of local GSFC services and performed by the IPNOC will be provided via a General Services Administration (GSA) Millennia contract with Raytheon. Systems Management and Operations functions provided in support of GSFC local services and performed by the NASCOM Operations Management Center, Goddard TV Central, Goddard Voice Control, and Goddard Technical Control Facilities will be provided by the MOMS contract. The UNITeS contractor shall establish agreements and joint operations procedures with the Millennia and MOMS and contractors for systems management and operations services performed at GSFC. The agreements shall address how the contractors will work together to accomplish the following:

a. Ensure there is no overlap in responsibility or authority with staffing;
r. Ensure overall staffing does not exceed available physical space;
s. Ensure continuity of service and efficient use of resources to perform end-to-end troubleshooting.

### 3.7.1 Network Scheduling

The contractor shall provide scheduling and coordination to optimize the operation of all WAN entities. The work period is normally performed 7:00 am to 7:00 pm, Central Time, Monday through Friday. The contractor shall:

a. Provide scheduling of satellite transponders, systems and circuit releases used in the network.
b. Distribute communication alert messages to network users and common carriers notifying them of mission critical support periods.
c. Issue preliminary and final service advisory messages as necessary.
d. Provide on-site coverage during mission critical periods, as defined by the COTR.
e. Maintain a daily log of all network-scheduling activities (DRD 974MA-006).
f. Coordinate and interface with the government and other contractors in accordance with government guidance.
g. Provide an e-mail-based activities scheduling system, which shall notify approved users of user-impacting activities at least 10 calendar days prior to conducting the activity. The contractor shall provide a feedback mechanism for customers to request cancellation or rescheduling of activities. The contractor shall also provide an electronic mail-based outage notification system to inform approved users of major service outages. Activity and outage reports shall be archived and available via the web to approved users (DRD 974MA-006). The contractor shall grant access to this system and archived information to the COTR-designated personnel and shall ensure no unauthorized users gain access
h. Adhere to NASA mission freeze policies which disallow network changes during mission-critical periods, follow the NASA freeze exemption request and waiver process, and coordinate requests for exemptions to network freezes.

### 3.7.2 Network Monitoring

The contractor shall provide network monitoring capabilities, tools, systems, and procedures to meet service performance requirements as specified in the NISN Services Document, NISN 001-001 (DRD 974MA-007). Network monitoring shall be performed so as not to impact operational service performance. The contractor shall provide:

a. Network monitoring and control of remote devices and physical parameters at remote gateways.
b. Visibility into supplier network management systems where available and secure.
c. Network-based monitoring tools that can be utilized to illustrate near-real-time service utilization and status. These tools shall illustrate capacity, performance, and utilization per location.

d.  Web-based tools illustrating performance metrics and specific bandwidth rates across Layer 3 hardware ports to be made available to approved customers and other help desks.

e.  Secure access to Layer 2 and Layer 3 network equipment to COTR-designated personnel.

f.  Reporting of service performance metrics in support of service level agreements (DRD 974MA-006).

g.  Software and hardware systems to monitor and control, in real-time, system performance parameters such as network latency and response for the entire system, end-to-end, from user device to the server.

h.  Monitoring, in real-time, of a user session, to view user interaction and keystrokes, and to intervene and take control if necessary.

i.  Discover and correct most system problems before causing any customer impact.

j.  Cable management tools, desktop appliance management tools, server management tools.

k.  Large screen display of critical, real-time, system parameters.

l.  View and document system traffic patterns and develop expansion plans to react to traffic peaks without user impact (DRD 974MA-006).

m. Capture data to support system tuning.

n.  Review and reconciliation of vendor outages to determine credits due to the government.

o.  Monthly and quarterly carrier performance reports to government (DRD 974MA-006).

p.  Recommendations to the government for the improvement of carrier performance and the resolution of recurring problems (DRD 974MA-006).

### 3.7.3    Network Control and System Management

The contractor shall be responsible for the account management, system administration, technical control, and WAN operational support.

### 3.7.3.1    Account Management

The contractor shall provide a unified approach for:

a.  Creating, deleting, changing, tracking, and reporting on user accounts and passwords for systems and tools used to provide the services in this PWS (DRD 974MA-007).

b.  Coordinating in a seamless fashion with the Integrated Financial Management Competency Center (IFMCC) to implement IFM and data center accounts (DRD 974MA-007).

### 3.7.3.2    System Administration

The contractor shall provide systems administration support for control center services.

### 3.7.3.3  Technical Control

The contractor shall:

a. Staff and maintain the control capability that is operational 24 hours per day 7 days per week at the NASA Information Category Level of "Mission (MSN)," as defined in NPG 2810.1.
b. Provide configuration of high speed, wideband and video transport systems to meet specific mission requirements.
c. Coordinate with the government and interface with other contractors in accordance with government guidance.

### 3.7.3.4  Domain Name Service (DNS)

The contractor shall provide systems engineering and sustaining engineering support functions for NASA's DNS systems, at the domain level of nasa.gov. In performance of this function, the contractor shall:

a. Provide name registration for systems at the nasa.gov domain.
b. Provide sub-delegation to networks required to join NASA's network domain; e.g., msfc.nasa.gov.
c. Provide updated security patches and updates to nasa.gov DNS servers.

### 3.7.4  Problem Management

The contractor shall maintain systems and processes to respond to service problems detected by the contractor or their vendors or to problems reported by users. The contractor shall provide:

a. A capability to automatically route calls to appropriate control center operators. This capability shall include dedicated voice communications lines (e.g., orderwires) between control centers.
b. User-initiated and supplier-initiated problem reporting and resolution processes (DRD 974MA-006).
c. Escalation procedures and contacts for the contractor and the suppliers (DRD 974MA-007).
d. Automatic tracking and logging of customer trouble calls (DRD 974MA-006).
e. Processes, criteria, and point of contact (including other services providers and suppliers) necessary for effecting problem resolution (DRD 974MA-007).
f. A knowledge management capability to assist in resolution of troubles on the first call and to identify trends.
g. Call status metrics such as caller queue times and abandoned calls (DRD 974MA-006).

h. Real-time fault isolation and restoration of failed services, including coordination with carriers.

i. Maintain a daily log of installation trouble shooting and restoration activities (DRD 974MA-006).

### 3.7.5    WAN Operations Support

The contractor shall provide operational support to maintain service performance requirements identified in the NISN Services Document, NISN 001-001 (DRD 974MA-007). This support shall include:

a. Onsite coverage during mission critical periods.

b. On-console mission operations, mission planning and test/simulation coordination.

c. Operations and technical support at major points of presence (such as NASA centers) and other locations.

d. The contractor shall participate in NISN, program, flight, and operational readiness reviews and certification of flight readiness reviews to ascertain whether WAN services are ready to support missions, programs, flight, and operational users (DRD 974MA-011).

### 3.7.6    Control Centers

The contractor shall operate and maintain the following facilities to provide services described in this PWS.

a. WAN Enterprise Network Management Center (ENMC).

b. Information Mission Control Center (IMCC).

t. Internet Protocol (IP) Network Operations Center (IPNOC) (Facility is shared with GSFC Millennia contractor).

u. NASCOM Operations Management Center (NOMC). (Facility is shared with GSFC MOMS contractor).

v. Goddard TV Central Facility. (Facility is shared with GSFC MOMS contractor).

w. Goddard Voice Control Facility. (Facility is shared with GSFC MOMS contractor).

x. Goddard Technical Control Facility. (Facility is shared with GSFC MOMS contractor).

### 3.7.7    Documentation and Configuration Management

The contractor shall:

a. Provide an online configuration management capability to document technical configurations, diagrams, and architectures as well as processes (DRD 974MA-007).

b. Create, review, and maintain documentation and databases.

c. Provide electronic and hardcopies of network and facilities drawings (DRD 974MA-007).

d. Provide a connection database to document the appliance, office jack, switch port, and network connectivity as required (DRD 974MA-007).

e. Utilize government software standards for generating and maintaining documentation.

## 3.8 CUSTOMER SUPPORT

The contractor shall ensure that all customer service elements of this contract are supported. This function shall include the customer support center, service requests, and user training.

### 3.8.1 Customer Support Center

The contractor shall receive, track, and resolve customer service problems. In performance of this function, the contractor shall:

a. Operate an integrated customer support center 24 hours a day, 7 days a week. This customer support center shall work cooperatively with other help desks to resolve all problems regardless of the initial determination of the origin of the problem and dispatch to the appropriate maintenance personnel.

b. Receive all trouble calls and promptly effect resolution.

c. Operate and maintain the on-line status system to query, update, and display information related to problems and resolutions (DRD 974MA-006).

d. Provide timely and accurate feedback regarding problem resolution as requested by the customer.

e. Perform trouble reporting and tracking (DRD 974MA-006).

f. Provide reports of status, summaries, and statistics (DRD 974MA-006).

g. Verify resolution with the customer prior to closing the trouble call.

h. Provide customer information and assistance regarding the use of UNITeS services.

i. Provide user notification of outages and activities.

j. Upon resolution of a trouble ticket/outage of service, provide the customer written information regarding the reason for trouble/outage, corrective actions taken, and relevant information for any follow-on action.

### 3.8.2 Service Requests

The contractor shall receive, process, and execute customer service requests. In performance of this function, the contractor shall:

a. Operate and maintain the on-line service request system for inputting, assigning, tracking, statusing, and archiving customer service requests as part of the MICS (DRD 974MA-006).

b. Implement only authorized service orders.

c. Provide the necessary coordination between the customer, CIO for funding verification and the technical support functions required to satisfy the request.

d. Provide monthly reports (DRD 974MA-006) to COTR-designated personnel that explain status of service requests.

e. Close each service request only after customer notification and acceptance.

### 3.8.3 User Training

The contractor shall provide training to customers for services developed or implemented under this contract. In performance of this function, the contractor shall:

a. Develop and conduct a formal user-training program to include classes, videotapes, hard copy tutorial information, and reference information (DRD 974MA-007).

b. Provide specialized training for both hardware and software, where COTS product training is not available (DRD 974MA-007).

### 3.9 INTEGRATED SERVICE DELIVERY SUPPORT

The contractor shall provide the integrated service delivery support functions necessary to perform the services described in Section 3 of this PWS. These functions include: engineering, implementation, maintenance, configuration management, collaboration, and disaster recovery.

### 3.9.1 Engineering

The contractor shall provide systems engineering and sustaining engineering support functions to perform the services described in this PWS.

### 3.9.1.1 Systems Engineering

The contractor shall perform systems engineering for existing and proposed systems. Within the scope of this function, a system typically includes the combination of hardware equipment and systems software. Systems software includes operating systems, compilers, database management systems, transaction management systems, switching systems, performance and utilization tracking systems, libraries, utilities, and other software necessary for the operation and execution of IT systems. In performance of this function, the contractor shall:

a. Maintain and update customer requirements (DRD 974MA-007).

b. Perform, in accordance with OMB guidelines for business cases, trade studies to maintain, balance, and optimize requirements allocations across subsystems (DRD 974MA-007).

c. Maintain online requirements inventory for all customer subsystems and services (DRD 974MA-007).

### 3.9.1.2    Sustaining Engineering

The contractor shall perform sustaining engineering on operational systems that are managed by the contractor.  In performance of this function, the contractor shall:

a.  Perform system performance studies, recommending appropriate changes to eliminate potential system bottlenecks, resources conflicts and system overloads (DRD 974MA-007).
b.  Isolate problems in systems and effect proper resolution, including the reporting, statusing, and documenting of changes.
c.  Perform capacity analysis of existing computational and telecommunication systems (DRD 974MA-007).
d.  Provide capacity planning recommendations based on analysis and changes in requirements and technology.  Obtain approval from the appropriate control board (DRD 974MA-007).
e.  Provide risk analysis and management that shall include continual identification and assessment of technical, schedule, cost, and organizational risks involved with the operation of systems (DRD 974MA-002).

### 3.9.2    New Service Implementation

The contractor shall provide design and development; systems integration and testing; and implementation support functions for new service implementation.  This includes, but is not limited to, documentation, drawings, pricing methodology, budgeting, operations approach, schedule, and training material.

### 3.9.2.1    Design and Development

The contractor shall design, develop, and prototype IT systems to meet customer requirements.  The contractor shall develop and document engineering specifications and drawings for components and systems that implement the designs.  In performance of this function, the contractor shall:

a.  Define requirements that shall include collecting and documenting customer (including written buyoff) or system requirements (DRD 974MA-007).
b.  Analyze the defined requirements ensuring that functionality, reliability, availability, maintainability, security, affordability, and policies and procedures are addressed.  Perform systems engineering trade studies to optimize requirements allocations across subsystems (DRD 974MA-007).
c.  Develop designs consistent with generally accepted engineering guidelines and practices.
d.  Maximize commonality and the use of COTS components.
e.  Coordinate external interface designs with the responsible oversight organization.

f. Conduct design reviews as requested by COTR designated personnel or customers.

g. Develop engineering prototype hardware and software components, subsystems, and systems to verify design and certify requirements.

h. Support the upgrading of the integrated infrastructure for all information systems.

i. Acquire, fabricate, assemble, and modify components, subsystems, and systems.

j. Support partnerships with industry, academia, and government agencies to accelerate the use of advanced technologies to meet NASA requirements.

k. Identify and coordinate local physical and electrical interfaces between the host facility, suppliers, and customers.

### 3.9.2.2 Systems Integration and Testing

The contractor shall be responsible for integration of hardware and software into operational configurations of computational and telecommunication systems. The contractor shall ensure that all elements of the system cohesively function as a fully integrated, operational system. The contractor shall perform testing of hardware, software, and telecommunication products. In performance of this function, the contractor shall:

a. Ensure customer-established functional requirements are met.

b. Ensure conformance with the applicable federal standards.

c. Ensure interoperability with existing systems.

d. Ensure design concepts are not inadvertently changed during the integration process.

e. Perform verification and validation testing independent of the design organization.

f. Perform technical reviews of integration and testing activities as requested by COTR designated personnel.

### 3.9.2.3 Implementation

The contractor shall install and integrate hardware, systems software, services, and applications software components into fully operational systems and verify satisfaction of the customer's performance requirements. In performance of this function, the contractor shall:

a. Assemble, install, connect, inspect and "stage" the systems.

b. Integrate, verify functionality, and document implementation of the services (DRD 974MA-006).

c. Perform verification testing of the systems under simulated load conditions, and assess failure modes of the systems.

d. Provide the customer written instructions that contain all relevant information for reporting a problem related to the service, equipment or software.

### 3.9.2.3.1 Installation

In performance of this function, the contractor shall:

a. Install the components into a fully operational configuration to meet the customer requirements.
b. Schedule implementations to minimize disruptions or impacts to services.
c. Verify that the connections, support equipment, and software for the system have been properly installed.
d. Ensure property control requirements (e.g., identification tags and stickers) are met (as defined in the approved Government Property Management Plan, which is prepared in accordance with DRD 974LS-001).

### 3.9.2.3.2 Assessment and Acceptance Testing

In performance of this function, the contractor shall:

a. Verify that the system is installed properly, and that the system satisfies customer's requirements using test and assessment methods, and written customer buyoff, as appropriate.
b. Conduct an acceptance review with CIO and customers, as requested by COTR designated personnel, presenting a summary of the verification results.

### 3.9.3 Configuration Management and Control

The contractor shall prepare, implement, and maintain a Configuration Management Plan (DRD 974CM-001) which describes the technical and administrative functions and databases necessary to identify and document the technical and architecture configuration requirements of systems, processes or projects, control changes, deviations, and waivers to these technical requirements, and record and report change processing and implementation status. The contractor shall maintain as-implemented systems configuration information to include hardware model numbers, software revision levels, user interface details, and circuit details, such as circuit numbers, circuit types, originating and terminating locations, installation date, and service request reference number.

### 3.9.4 Maintenance

The contractor shall maintain in a fully operational condition all hardware and software for those systems which the contractor has responsibility (see Appendix A). Items to be maintained, consistent with the categories of hardware and software described in this PWS, may be routinely added or deleted throughout the period of performance of this contract. These changes are considered within the scope of this PWS and shall not, in general, be construed as changes within the meaning of the "Changes -- Cost-Reimbursement -- Alternate II" clause of this contract as long as the total number of

hardware items to be maintained (see DRD 974RM-001, Operability/Maintainability Plan) is not less than 6,000 and not greater than 17,000. In performance of this function, the contractor shall:

a. Prepare, implement, and maintain the Operability/ Maintainability Plan (DRD 974RM-001).
b. Maintain an online system that contains information on operational failures, incidents, discrepancies, and problem disposition and resolution that includes a daily log of all maintenance and repair activities (DRD 974MA-006).
c. Prepare and deliver status reports (DRD 974MA-006) providing information on outages, such as component involved, period of downtime, and corrective actions.
d. Compile and maintain a list of key contacts responsible for coordinating and conducting the required hardware and software maintenance functions (DRD 974MA-007).
e. Maintain warranty protection and conditions for equipment in warranty.
f. Maintain vendor subscriptions describing and providing updates and enhancements.
g. Maintain a complete, up-to-date, and accurate list of spare parts and related material necessary to maintain the equipment (DRD 974MA-007).
h. Ensure availability of parts for both maintenance and production functions.
i. Maintain a real time, up-to-date service record for each system. The record shall include: the date and type of equipment, service performed, list of parts used and costs, staff-hours utilized, and downtime, or time not available for use of equipment (DRD 974MA-007).
j. Maintain a working relationship with vendors or other NASA Centers necessary to obtain required items or maintenance in a timely manner.
k. Maintain up-to-date vendor documentation for all systems (DRD 974MA 007).
l. Coordinate maintenance activities with NASA centers, customers, other service providers, and other contractors.

### 3.9.4.1    Preventive Maintenance (PM)

The contractor shall perform PM, defined as maintenance performed by the contractor that is designed to keep the hardware and software in proper operating condition. The PM is performed on a scheduled basis, normally during the Principle Periods of Maintenance (PPM) defined for each system in the approved Operability/Maintainability Plan (prepared in accordance with DRD 974RM-001).

a. In performing PM on hardware equipment, the contractor shall:
1) Develop PM schedules that minimize disruption to customer operations. Provide PM schedules in accordance with DRD 974RM-001.
2) Perform adjustments, cleaning, lubrication, and replacement of parts as specified according to published maintenance procedures.
3) Install latest releases of Field Change Orders (FCO's) and other hardware updates.
y. In performing PM to software, the contractor shall:
1) Acquire, test, and install software updates. Software tests and installations shall normally be performed during scheduled system test periods.
2) Track and renew system software licenses (DRD 974MA-007).
3) Evaluate vendor-supplied updates or patches for applicability.
4) Implement system software releases.

### 3.9.4.2 Remedial Maintenance (RM)

The contractor shall perform RM, defined as that maintenance performed which results from equipment and software failure. It is performed as required on an unscheduled basis. RM shall be performed on all hardware and software elements specified in this contract. In performance of this function, the contractor shall:

a. Perform RM promptly after notification that the component is inoperative.
z. Ensure that the RM is performed to meet the customer's requirements and minimizes operational impact to the customer.
aa. Plan, implement, and enforce operational procedures to ensure that the system continues to operate while any failed component is being replaced. Document operational procedures in the Operability/Maintainability Plan (DRD 974RM-001).
bb. Ensure that the maintenance tools, spares, procedures, skills, and response times are adequate to meet the requirements of the approved Operability/Maintainability Plan (prepared in accordance with DRD 974RM-001).

### 3.9.5 Collaboration

The contractor shall establish and maintain contact with internal and external technical working groups consisting of IT professional associations and vendor systems experts to assist in accomplishing its mission.

### 3.9.6 Disaster Recovery

The contractor shall test the Disaster Recovery Plan (prepared in accordance with DRD 974MA-007) to ensure the orderly recovery from a disaster that may render all or part of information facilities, systems, and equipment inoperable. The contractor shall also test the Business Continuity Plan (prepared in accordance with DRD 974MA-007).

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# 4. IFMP INTEGRATION SERVICES

The contractor shall be responsible for executing all functions and services defined below in support of the roles and responsibilities assigned to the Integrated Financial Management Program (IFMP) Integration Project Office (IPO) at MSFC. These functions and services are categorized in three major areas: infrastructure support, module project support, and operations and sustaining support. These functions and services include operation/ maintenance of existing capabilities, development or acquisition, and implementation of enhancements or COTS products.

## 4.1 INFRASTRUCTURE SUPPORT

The contractor shall be responsible for developing, documenting and maintaining an Enterprise Architecture for IFMP. The contractor shall provide a methodology and tool set for the documentation and maintenance of this enterprise architecture. The contractor may elect to utilize the existing IPO tool set for architecture documentation or propose their own tool(s) and methodology. The Enterprise Architecture shall consist of the IFMP Business, Applications, and Technical Architectures (DRD 974MA-007).

### 4.1.1 Business Architecture

Through interaction with each module's NASA process team and each module project's implementation contractor, the contractor shall utilize an enterprise architecture tool to document the business processes implemented by the module (DRD 974MA-007). The business architecture shall include all modules (including those not yet initiated) and shall represent a blueprint of the interaction between the high-level functions and processes. The process models shall be incorporated and maintained in the IFMP repository. The contractor shall update these models as business processes are updated to insure that a central repository always contains accurate descriptions of the business processes implemented by the collective modules that make up the total IFM system. Different implementation contractors may be utilized for different module projects and each may utilize different implementation methodologies and tool sets; however the contractor shall maintain the central repository that documents all processes across all modules.

### 4.1.2 Application Architecture

Through interaction with each module's NASA process team and implementation contractor, the contractor shall utilize existing tools to further develop and maintain the Application Architecture (DRD 974MA-007) throughout the life of IFMP. The applications architecture shall include the key interfaces and information needs between modules, and a definition of how those interfaces will be implemented. The contractor shall insure that the Application Architecture facilitates the use of the IFM Integration Architecture by including standard events and messages (data) that are associated with each integration.

### 4.1.3    Technical Architecture

The contractor shall define, implement, and maintain the IFMP technical architecture and coordinate with the Agency CIO to insure that the IFMP architecture is compliant with the overall Agency IT architecture (DRD 974MA-007). The contractor shall annually assess future directions and developments in information technology to insure that the IFMP architecture evolves to take advantage of new product releases by software and hardware vendors.

### 4.1.3.1    Integration Architecture

The contractor shall maintain and enhance the IFM integration architecture, which is based on EAI technology. The contractor shall provide and utilize a methodology that takes advantage of the EAI technology to shorten interface development timelines and reduce long-term maintenance costs. The contractor shall ensure that the integration architecture and associated product set supports evolving standards and technologies and is positioned to support NASA's ability to conduct electronic commerce with its customers and trading partners.

### 4.1.3.2    Information Delivery Architecture

The contractor shall maintain the IFMP reporting and information delivery architecture to be utilized for each module. As additional applications are implemented, the contractor shall evolve the architecture to incorporate SAP and non-SAP data into the data warehouse. The contractor shall establish a metadata management process for the information stored in the Business Information Warehouse (BW).

### 4.1.3.3    Security Architecture

The contractor shall develop and maintain NPG 2810.1-compliant Security Plans for the underlying infrastructure components in accordance with DRD 974CD-001. The contractor shall also interact with NASA and contractor IT Security personnel in the review and audit of these documents and associated security activities such as risk assessments and intrusion detection exercises.

### 4.1.3.4    Systems Architecture

The contractor shall develop and maintain the technical infrastructure that is common across all module projects. Examples of infrastructure elements include: backup/recovery systems, storage systems, EAI components, data center networks/firewalls, and systems management/monitoring tools. The contractor shall design the infrastructure in a manner that maximizes systems management efficiencies and cost savings thereby reducing the operational costs while increasing customer satisfaction.

### 4.1.3.5 Operations Architecture

The contractor shall be responsible for working with both module projects and IFMP service providers (vendors, NACC, NISN, etc.) to plan for the eventual end state operational model. The operations architecture shall include, but not be limited to:

    a. Backup and Recovery
    b. Job Scheduling
    c. Event Management

## 4.2 MODULE PROJECT SUPPORT

The IFMP consists of a series of projects organized around specific functional modules. The Integration Project is responsible for providing key elements of module project implementations. The contractor shall provide the following elements of module project support.

### 4.2.1 Agency Design

The objective of the Agency Design Phase is to achieve a standard, Agency configured system, well defined Agency interfaces and reengineered processes that operate within the capabilities of the software.

### 4.2.1.1 Technical Architecture

The contractor shall define a more detailed technical architecture that consists of products and technologies that meet the requirements of the module project (DRD 974MA-007). The contractor shall also develop appropriate work plans and allocate resources to deploy these components in accordance with each module's baselined schedule and implementation approach (DRD 974MA-006). The implementation of the technical architecture shall require close coordination with the module project's implementation contractor

### 4.2.1.2 Configuration and Data Conversion

The contractor shall provide subject matter experts to augment the Agency process team at a level required to provide Application Functional Support as defined in section 4.3.3. This support enables the contractor to gain knowledge of the application configuration as it is being developed in order to provide sustaining support. The contractor shall also provide the tools and underlying system environments (e.g., Development, Test, Staging, Production) necessary to support the process team and its Implementation Contractor during the application configuration and data conversion activities. This shall require the contractor to establish an effective working relationship with both entities so that requirements may be understood and translated into each module's work plan for execution in a timely manner. The contractor shall be responsible for taking security requirements and initial roles and developing the final design and implementation of security roles and profiles required for the module (DRD

974MA-007). Finally, the contractor shall develop and maintain an NPG 2810.1-compliant Security Plan for each module in accordance with DRD 974CD-001.

### 4.2.1.3   Business and Application Architectures

Working with each module's process team, the contractor shall update and maintain the IFMP Business and Application architectures as described in sections 4.1.1 and 4.1.2 to reflect the Agency Design as approved by the module project steering committee (DRD 974MA-007).

### 4.2.1.4   Agency Interfaces

During the Agency Design phase, Agency Interfaces are identified and developed. Agency interfaces are interfaces between the IFM module and other Agency systems. The contractor shall define and follow a development methodology for interface development. The contractor shall lead the identification of Agency interface requirements, coordinate the functional design and requirements analysis process, develop the necessary technical designs, and develop all software components that must be built in the new IFM module or in the EAI tool. The contractor shall coordinate with the implementation contractor to insure that this development method integrates with the module project's implementation methodology and schedule. The contractor shall conduct unit testing and end-to-end testing of all interfaces before migrating the interfaces to system integration testing.

### 4.2.1.5   Extensions and Bolt-Ons

During Agency Design, the module project process team and implementation contractor may identify certain gaps that exist between the selected COTS product's base functionality and NASA's requirements. Options for addressing a gap include implementing a $3^{rd}$ party COTS bolt-on that must be interfaced with the module or developing an extension in the COTS development environment. The contractor shall be responsible for developing any interfaces required between the module and selected bolt-ons. The contractor shall also be responsible for designing and developing any required extensions based on the functional designs delivered by the module project. The contractor shall conduct unit testing of any extensions and/or bolt-on interfaces before migrating these components to system integration testing.

### 4.2.1.6   Testing

The contractor shall support System Integration Testing for each individual module. Contractor representatives shall coordinate with each project during Agency Design to insure that the project's test plan includes the appropriate integration testing. The contractor shall support system integration testing by assisting testers with execution of Agency interfaces, bolt-on interfaces, extensions, and reports. The contractor shall also provide fixes for approved system discrepancies related to these components. The contractor shall provide the servers, databases and application instances to be utilized by the module projects in conducting unit, system, and integration testing. The contractor shall manage all security and system accounts required during the test phase (DRD

974MA-007). The contractor shall coordinate with each module to define a set of system performance requirements (DRD 974MA-007). The contractor shall develop a performance and scalability test plan in conjunction with each module project (DRD 974MA-007). Existing performance and scalability testing tools shall also be utilized. The contractor shall conduct the performance and scalability test in support of each module project.

### 4.2.1.7    Operations Planning

The contractor shall define the operational processes required and coordinate their implementation with the Module Project. The Module Project Operations Plan, Service Level Agreement (SLA) and Center Operational Level Agreements (OLA), defining how the system will be supported during production, shall be developed concurrently during the Agency Design and Pilot phases of each Module Project (DRD 974MA-007). This shall include the development of training plans to ensure that the Competency Center staff are prepared to operate the new module as described in section 4.3.

### 4.2.1.8    Systems Support

The contractor shall provide the system resources (e.g., databases, application instances, etc.) to be utilized by each module project and respective Implementation contractor in conducting Agency design activities. The contractor shall utilize defined, disciplined operational processes to operate the development and test environments during the Design phase.

### 4.2.1.9    Agency Reporting

In accordance with the responsibilities as described in section 4.1.3.2, the contractor shall work closely with each module project and respective implementation contractor to analyze Agency reporting requirements in the context of the Information Delivery Architecture. The contractor shall coordinate with the Agency Process Team and implementation contractor as module reporting requirements are developed. The contractor shall be responsible for designing, developing and implementing the reporting solution. The contractor shall develop and implement the data model, metadata definitions, and data structures necessary to support the defined Agency reports.

### 4.2.2    Agency Rollout

The purpose of the Agency Rollout phase is to implement the solution developed during the Agency Design Phase at each of the NASA Centers. Each module project will have a defined rollout schedule.

### 4.2.2.1    Detailed Technical Architecture

In accordance with section 4.2.1.1, the contractor shall implement the module technical architecture that is represented by the deployment of hardware, software, communication, and security components that are necessary to execute the application.

This shall include all centralized data center components as well as any distributed components at other NASA Centers.

### 4.2.2.2    Configuration Support

The contractor shall provide the tools and underlying system environments (e.g., Development, Test, Staging, Production) necessary to support the process team and its Implementation Contractor in conducting rollout activities at the Centers. The contractor shall establish an effective working relationship with both entities so that requirements may be understood and translated into each module's work plan for rollout execution in a timely manner (DRD 974MA-006).

### 4.2.2.3    Business and Application Architectures

The contractor shall coordinate with each module's process team to update and maintain the IFMP Business and Application architectures as described in sections 4.1.1 and 4.1.2 to reflect the Center design as approved by the module project steering committee (DRD 974MA-007).

### 4.2.2.4    Center Interfaces

The contractor shall coordinate all analysis, design, development and testing activities for interfaces between IFMP modules and Pilot Center systems. The contractor shall coordinate with the Agency process team, implementation contractor, and owners of the interfacing system in the definition, development, and testing of these interfaces. The contractor shall lead the process team through an analysis phase that defines the interface business scenarios; interface edits and processing rules; and the roles and responsibilities of the Contractor, the Module project implementation contractor, and the Pilot Center system owners/contractors for the design, development and management of the interfaces. The contractor shall develop all software components that must be built in the new IFM module or in the EAI tool to support the Center interfaces. The interfaces shall be designed and developed in accordance with the IFMP Integration Architecture and Methodology.

### 4.2.2.5    Testing

The Agency Rollout phase will include system integration testing at each Center. The contractor shall support system integration testing at each Center by assisting testers with execution of Agency interfaces, bolt-on interfaces, extensions, reports, and any Center specific interfaces, extensions, or reports that are developed during the Agency Rollout phase. The contractor shall also provide fixes for approved system discrepancies related to these components. The contractor shall provide the servers, databases and application instances to be utilized by the module projects in conducting unit, system, and integration testing. The contractor shall manage all security and system accounts required during the test phase (DRD 974MA-007).

### 4.2.2.6    Center Reporting

In accordance with the responsibilities as described in section 4.1.3.2, the contractor shall coordinate with each module project and respective implementation contractor to analyze Pilot Center reporting requirements. The contractor shall be responsible for implementing the defined reporting solution at the Center and developing Center specific reports required to support Agency rollout.

### 4.2.2.7    Center Training

The contractor shall be responsible for defining the technical architecture for the tools that will be utilized in the development of training materials (DRD 974MA-007). The contractor shall insure that automated training capabilities can be deployed consistent with the Agency's IT architecture standards. The contractor shall also deploy and manage an instance of the system that will be utilized by the module project and implementation contractor in the execution of application training.

### 4.2.2.8    Center Data Conversion

The contractor shall coordinate with the module project to understand the volume of data to be migrated and the potential impact on system scalability and performance. The contractor shall also maintain an awareness of functional configuration decisions that are made during Agency Design and the potential performance and scalability impacts of those decisions. As directed by the COTR, the contractor shall provide data conversion tools to the module project.

### 4.3    OPERATIONS AND SUSTAINING SUPPORT

The contractor shall provide operations and sustaining support upon completion of the implementation stabilization period for each module project. The contractor shall provide a Competency Center (CC) for centralized operational support. This support shall include: business process, user interface, application functional, application development, application operations, and infrastructure. The operations and sustaining support performance standards are defined in each module's Service Level Agreement (DRD 974MA-007).

### 4.3.1    Business Process Support

The contractor shall assist the NASA business process experts in the Competency Center by supporting customers in the execution of standard NASA business processes within each IFMP module. The business processes are defined by the Agency Process Team during implementation and maintained by an Agencywide configuration control board when the system is operational.

### 4.3.2    User Interface Support

The contractor shall coordinate with each Center's NASA and contractor desktop service providers during the lifecycle of each module project to optimize the

Center's readiness for implementation. After the contractor has completed testing of each application release, it shall stage all components (software, release notes, etc.) on the IFMP software distribution server and notify designated Center contacts of general availability.

### 4.3.3    Application Functional Support

The contractor shall perform application functional support for each module after completion of the implementation stabilization period. In providing this support, the contractor shall:

a. Possess detail application knowledge.
b. Perform software configuration tasks.
c. Generate queries and basic reports.
d. Develop and maintain security management processes (DRD 974CD-001).
e. Provide Level II help desk support for the application.
f. Maintain end-user training plans and materials (DRD 974MA-007). The contractor shall maintain training materials and job aids that are used Agencywide. The Centers will be responsible for maintaining any Center-specific training materials.
g. Maintain the configuration tables that are defined as Agency configuration items.
h. Maintain all master data that is defined as centrally maintained.
i. Assess the impact of proposed changes to the baselined system.

### 4.3.4    Application Development Support

The contractor shall perform application development support for each module after completion of the implementation stabilization period. To accomplish this tasking, the contractor shall:

a. Use vendor-provided or other third-party tools to enhance the application.
b. Build extensions to the core software or augment with third party products.
c. Integrate the ERP solution with other applications or legacy systems.
d. Develop enhanced information delivery and reporting capabilities.
e. Assist in solving problems that relate to the technical characteristics of the ERP package.
f. Provide break/fix support for custom developed extensions, reports, and interfaces.

As a function of this support, the contractor shall define and implement a software release management strategy that incorporates enterprise requirements for change request, change control, and configuration management.

## 4.3.5    Application Operations Support

The contractor shall perform application operations support for each module. The contractor shall be responsible for:

a. System software (operating system, database and application) licensing, administration, installation, configuration and maintenance.
b. Monitoring availability and performance of the ERP system (application, operating system, database servers and network)
c. Monitoring of available vendor application patches.
d. Analysis of potential impacts of vendor supplied patches.
e. Application of vendor supplied patches.
f. Assisting with planning and support of efforts for major release upgrades.
g. Database administration.
h. Print management.
i. Workflow management.
j. Job scheduling.
k. Performing operating system, database and application security administration.
l. Service Level Agreement (SLA) reporting (DRD 974MA-006).

## 4.3.6    Infrastructure Support

The contractor shall provide enterprise support for the hardware and network systems and services including the application and database servers utilized by the ERP applications. The infrastructure support shall include:

a. Hardware acquisition, installation and maintenance.
b. Planning and testing disaster recovery (DRD 974MA-007).
c. Storage management (allocation, backups, restores, archiving).
d. Network performance monitoring.
e. Asset Management for all IFMP information technology assets (DRD 974MA-007).

The IFMP infrastructure support described above is provided within sections 3.3, 3.4, 3.6, 3.7 and 3.8 of the PWS.

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# 5.    MSFC INFORMATION SERVICES

The MSFC Information Services include those CIO mission requirements that service the MSFC customer base. This includes applications and web services, midrange computer systems, telecommunications, IT security, audiovisual information, documentation repository, hardware maintenance, IT procurement, and customer support services. The contractor shall meet, measure and report the service-level objectives and performance for each of the services defined in Section 5 of this PWS. The contractor shall provide self-assessment reports for these services in accordance with DRD 974MA-010.

## 5.1    MSFC APPLICATIONS AND WEB SERVICES

The contractor shall provide computer applications and web services for MSFC customers. These services shall include development, sustaining support and production support in compliance with established software and web standards. The applications and web descriptions shall be maintained in the Applications and Web Services Manual in accordance with DRD 974MA-007.

Development and sustaining support includes definition and specification, requirements analysis and feasibility studies, design and development, configuration management, user assistance and training, documentation, ongoing maintenance (repairs and upgrades), other operational support, and replacement or retirement. For non-Outsourcing Desktop Initiative for NASA (ODIN) commercial-off-the-shelf (COTS) applications, this support includes evaluation, procurement, installation, integration, testing, training, user assistance, administration and other operational support. This service also includes application-related consulting, subject matter technical experts, and technical management.

These services also include data preparation, data entry, initiation and monitoring of production programs, user assistance, and generation, review and distribution of reports.

The contractor shall provide the means, in conjunction with Agency efforts, to foster web site compliance with all Federal laws and Agency and Center policies. In addition, the contractor shall provide the means to audit the entire MSFC web environment to help ensure legal and policy compliance pertaining to Federal websites, whether the site is developed and/or maintained by the contractor or not. These services shall include web site development, hosting and maintenance, and searching and indexing.

The contractor shall perform Data Administration (DA) in the planning, organization, design, control, and documentation of data resources for all CIO-supported systems. In performance of this function, the contractor shall:

a. Establish and implement consistent overall DA strategies, such as data definition, logical data modeling, data resource life cycle management, data security, data integrity, and quality assurance.
b. Establish, implement, and maintain a DA program that incorporates the following subelements: DA policies, procedures and standards, data architecture, data dictionary and models, orientation and training, and quality assurance (DRD 974MA-007).

The contractor shall integrate the delivery of applications and web services to the maximum extent feasible. All services to be provided may be routinely added or deleted throughout the period of performance of this contract. These changes are considered within the scope of the PWS and shall not, in general, be construed as changes within the meaning of the "Changes – Cost-Reimbursement – Alternate II" clause of this contract as long as the total number of applications and websites to be provided fall within the following parameters:

| CATEGORY* | NUMBER OF APPLICATIONS |
|---|---|
| 1 | 30 – 40 |
| 2 | 25 – 40 |
| 3 | 75 – 110 |

| | NUMBER OF WEBSITES |
|---|---|
| 1 | 6 - 10 |
| 2 | 30 - 55 |
| 3 | 80 - 135 |

* See Appendix B

The contractor shall provide Applications and Web Services Reports in accordance with DRD 974MA-006.

## 5.1.1    Product Line Organizations

The contractor shall provide applications and web services for MSFC's product line organizations that include the Space Transportation Directorate, the Flight Projects Directorate, the Science Directorate, the Space Shuttle Projects Office, and the Second Generation Reusable Launch Vehicle Project Office. Examples of these applications services are NASA Structural Analysis (NASTRAN) support, Advanced Concepts support, Systems Administration, Dynamic Data Analyzer production support, Virtual Research Center support, National Space Science and Technology Center (NSSTC) support, Microgravity applications, Space Science Applications, and Space Shuttle Project Office support. Examples of web sites developed for these organizations include internal and external sites for Flight Projects, the Microgravity homepage, the site for the g-LIMIT research, internal and external sites for Space Transportation, and the Prop Module research site.

## 5.1.2 Support Organizations

The contractor shall provide applications and web services for MSFC's support organizations that include the Engineering Directorate, the Center Operations Directorate, and the Customer and Employee Relations Directorate. Examples of these applications services provided to the Engineering Directorate are NASTRAN support, Structural Load Test Measurement Acquisition System (SLTMAS), Engineering Technology Development Office Database support, Antenna Range Data Collection, Materials and Processes Technical Information System (MAPTIS), Integrated Manufacturing Project Planning and Control System (IMPACS), Electromagnetic Compatibility (EMC) support, Global Reference Atmospheric Model (GRAM) support, NASA Standards support, Configuration Management, and the Integrated Engineering System (IES).

The contractor shall provide applications services to the Center Operations Directorate such as the Management Information Control System (MICS); the Center Operations Services Management Information System (COSMIS); the Computerized Maintenance Management System (CMMS); the Marshall Calibration Management System (MCMS); the Service Request System (SRS); the Computing and Communications Asset Information Management System (CCAIMS); the Problem Management and Dispatch System (PMDS); the MSFC Employee Data Information System (MEDIS); and the site-unique portions of NASA Equipment Management System (NEMS), NASA Property Disposal Management System (NPDMS), and NASA Supply Management System (NSMS).

The contractor shall provide applications services to the Customer and Employee Relations Directorate such as the MSFC Personnel Information System (MPIS), the Retirement Annuity System (RAS), the Personnel Awards System (PAS), Electronic Meeting System (EMS) support and site-unique portions of the NASA Payroll/Personnel System (NPPS).

Examples of web sites developed for these organizations include internal, external, and customer focused sites for the Engineering Directorate, as well as, the Center Operations Directorate; highly specialized educational sites; center historical sites; and sites specifically designed for news media relations

## 5.1.3 Office of the Director and Staff Offices

The contractor shall provide applications and web services for MSFC's Office of the Director and the staff offices of Procurement, Chief Financial Officer (CFO), Systems Management, Safety and Mission Assurance, Equal Opportunity, and Chief Counsel. Examples of applications services provided to these customer organizations are the Director's Office support, the Centerwide Action Item Tracking System (CAITS), CFO core applications support, the MSFC Resources Planning Tool (MRPT), and the Procurement Data Warehouse System (PDWS). Examples of web sites developed for these organizations include internal sites for center staff notes and center events, collection of charitable gifts from center employees, presentations and charts for center

executives, equal employment opportunity outreach, export control and safety information.

## 5.2     COMPUTER SYSTEMS SERVICES

The contractor shall provide midrange computer systems services to support the application services described in Paragraph 5.1. Computer systems services encompass providing hardware, operating systems, other systems software, computer operations, hardware/software maintenance, technical assistance, and other requirements for applications execution. These services include operation/maintenance of existing systems, acquisition/implementation of COTS products, database administration, and development of unique systems in compliance with established architecture standards. The system configuration documentation shall be maintained in the online Midrange Node Book in accordance with DRD 974MA-007.

### 5.2.1     Business, Engineering and Scientific Midrange

The contractor shall provide computer systems services to support MSFC's administrative, business, engineering and scientific applications. These applications execute on midrange computers identified in Appendix A, Category I. In providing these services, the contractor shall:

a. Provide hardware and systems software enhancements to meet customers' requirements in response to changing workloads and technologies.

b. Provide and maintain operating systems, database management systems, compilers, libraries, and all other systems software necessary for the operation, execution and security of the computer and communications systems.

c. Operate and maintain computer, peripheral, data acquisition, and communications systems, to include system initializations and recoveries, storage management, and print production and dissemination.

d. Provide system administration such as program and data security, scheduling, and quality control.

e. Provide security support as required by NASA, in particular, adhering to new security bulletins and installation of patches to fix known vulnerabilities as well as working within restrictions involving firewalls and other security-related constructs, maintaining compliance with NASIRC bulletins, utilizing Secure Shell for host authentication, user authentication, and encryption, and the use of TCP/IP wrappers and System monitoring for anomalies and security break-in attempts.

f. Provide management of users to include: addition and deletion of userids, disk quotas, accounting and access control, utilization reports, consultation on advancing technologies, video and imaging support and data visualization (DRD 974MA-006 and DRD 974MA-007).

g. Provide backups and restoration of the systems including all system files, file systems, directories, and/or user files.

## 5.2.2    User-Owned Midrange

The contractor shall provide computer systems services to support user owned midrange systems. These systems are identified in Appendix A, Category II and III. In providing these services, the contractor shall:

a. Provide hardware and systems software enhancements to meet customers' requirements in response to changing workloads and technologies.
b. Provide and maintain operating systems, database management systems, compilers, libraries, and all other systems software necessary for the operation, execution and security of the computer and communications systems.
c. Operate and maintain computer, peripheral, data acquisition, and communications systems, to include system initializations and recoveries, storage management, and print production and dissemination.
d. Provide system administration such as program and data security, scheduling, and quality control.
e. Provide security support as required by NASA, in particular, adhering to new security bulletins and installation of patches to fix known vulnerabilities as well as working within restrictions involving firewalls and other security-related constructs, maintaining compliance with NASIRC bulletins, utilizing Secure Shell for host authentication, user authentication, and encryption, and the use of TCP/IP wrappers. System monitoring for anomalies and security break-in attempts must be accomplished.
f. Provide management of users to include as required by the users: addition and deletion of userids, disk quotas, accounting and access control, utilization reports, consultation on advancing technologies, video and imaging support and data visualization (DRD 974MA-006 and (DRD 974MA-007).
g. Provide backups and restoration of the systems including all system files, file systems, directories, and/or user files.

## 5.2.3    Test Area

The contractor shall provide computer systems operators to support MSFC's Test Area data acquisition systems. These systems, support MSFC's East and West Test Areas, include various HP Alpha computers, MODCOMP computers, PC's, plotters, printers, disk drives, tape drives, and controllers. These data acquisition systems record raw test data, convert the data to engineering units, display tabulated and graphical results during the tests, and provide post-test conversion and storage of data for distribution. These systems are operated during the day shift and during test periods.

## 5.2.4    National Space Science and Technology Center (NSSTC)

The contractor shall provide engineering, software and hardware maintenance, operations, and system administration for all the NSSTC.

## 5.2.4.1  Infrastructure Systems

In support of the infrastructure systems, the contractor shall:

a. Monitor the physical cable plant, including 24x7 monitoring for environmental change in key areas; provide Uninterruptible Power Supply (UPS) maintenance and engineering; and dark fiber maintenance and engineering between MSFC and NSSTC.
b. Engineer, operate and maintain NSSTC routers, firewalls, switches, Virtual Private Network (VPN) and dial-in devices, and IP Telephony systems.
c. Engineer, operate and maintain infrastructure peripherals, such as network printers, electronic facsimile system, scanners, wireless access points and network based TV (IPTV) screens and systems.
d. Engineer, operate and maintain infrastructure server systems, including web, e-mail, domain, IP Telephony and unified messaging servers, domain controllers for Active Directory, and other servers supporting core network functions (see services below).

## 5.2.4.2  Infrastructure Services

In support of the infrastructure services, the contractor shall:

a. Maintain the Domain Name Service (DNS), Dynamic Host Control Protocol (DHCP), Windows Internet Naming Service (WINS), Radius authentication protocol, Microsoft Active Directory, and Network Time Protocol support (Stratum 0).
b. Operate and maintain the VPN server and client software and Dial-in service.
cc. Provide integrated electronic mail, voice mail and personal fax services.
dd. Provide printer and user data storage services.
c. Provide backup services for all infrastructure systems. The contractor shall maintain an offsite storage facility for backup tapes for disaster recovery.
d. Provide port-level security (switch level) administration.
e. Provide wireless access services engineering and maintenance.
f. Provide system administration for the following systems:
    1) SGI.
    2) Linux.
    3) Solaris.
    4) W2K/NT/XP.
    5) Win 9x.
    6) Macintosh (9.x and OSX+).
    7) OpenVMS.

### 5.2.4.3  Desktop User Services

In support of the desktop user services, the contractor shall:

a.  Provide engineering, hardware, operating system installation, troubleshooting, and reconfigurations.
b.  Maintain user software for desktop-based antivirus scanning and operating system security patches.
c.  Install, relocate, configure, and maintain IP Telephony (Voice over IP) services.
d.  Provide centralized application services, including user data areas, applications, system application downloads and patches.
e.  Provide backup of user desktop data areas as directed by the COTR.

## 5.3  CUSTOMER REQUESTED HARDWARE MAINTENANCE

The contractor shall also be responsible for hardware maintenance of MSFC's non-ODIN computer equipment, including laboratory equipment, referenced in Appendix A, Category III. In providing this service, the contractor shall:

a.  Perform repairs and other Remedial Maintenance (RM) following equipment failure in accordance with approved Operability/Maintainability Plan (prepared in accordance with DRD 974RM-001).
b.  Perform scheduled Preventive Maintenance (PM) checks and repair equipment malfunctions in accordance with approved Operability/Maintainability Plan (prepared in accordance with DRD 974RM-001).
c.  Install and relocate IT computer equipment.
d.  Maintain systems through engineering changes and updates.

## 5.4  TELECOMMUNICATIONS SERVICES

The contractor shall provide telecommunications services to support the MSFC and Michoud Assembly Facility (MAF) customers. These include telephone, facsimile, and other services.

### 5.4.1  Telephone Service

The contractor shall provide telephone services at MSFC and MAF. These services include operation/maintenance of existing capabilities, development or acquisition of enhancements, and implementation of enhancements. In providing this service, the contractor shall:

a.  Operate and maintain the telephone and voice mail systems and associated equipment.

b. Provide telephones and associated features such as call forwarding, conferencing, call pickup, transfer, voice mail, and other features.
c. Install, relocate, configure, and maintain the telephone instruments and other end-service equipment and capabilities.
d. Install, configure, and maintain small conferencing units for the office environment.
e. Provide overhead paging service capable of broadcasting voice messages in specified areas.
f. Provide pager services, cellular telephones and wireless telephone service for authorized personnel.
g. Operate and maintain the voice over Internet Protocol (IP).
h. Provide specification of requirements, design, implementation, procurement, and operations of local telephone service, including dial-tone, inbound/outbound trunking, fiber to near-site locations, and access to 911.
i. Provide specification of requirements, design and interface to long distance switched voice and data services, provided by FTS2001.
j. At MSFC only, provide operator assistance for placing international calls, directory assistance, and other operator-required functions.
k. At MSFC only, compile and prepare the MSFC Telephone Directory (DRD 974MA-007).
l. Provide and maintain telephone service for fire rescue locations as designated by the MSFC Safety Office. Fire rescue locations are designated in multi-story buildings to assist the handicapped with evacuation in case of a fire.
m. Provide, test, and maintain power fail telephones. Power fail telephone circuits do not connect to or go through the MSFC telephone system. The power fail telephones shall operate in the event the MSFC telephone system loses power or becomes inoperable.

## 5.4.2   Facsimile Service

The contractor shall provide facsimile services that include MSFC and MAF facsimile. These services include maintenance of existing capabilities, development or acquisition, and implementation of enhancements. In providing this service, the contractor shall:

a. Maintain the existing facsimile machines and services.
b. Procure, install and maintain facsimile hardware and services including those appropriate for the transmission of Government classified documents.
c. Procure, install and maintain facsimile hardware and software to integrate this service with MSFC electronic mail services.

### 5.4.3    Other Services

The contractor shall provide other services required to meet customer requirements. These services include maintenance of existing capabilities, development or acquisition, and implementation of enhancements. In providing these services, the contractor shall:

a. Provide fixed, portable, and mobile radios.
b. Provide radio frequency spectrum management service.
c. Provide and maintain interbuilding cable systems and system documentation (DRD 974MA-007).
d. Provide and maintain the Emergency Warning System (EWS), the Marshall Access Control System (MACS), and the Video MACS (VMACS).
e. Provide emergency telecommunications and operations support services during disaster/emergency situations such as fire, explosion, accident, bomb threat, civil disturbance, terrorist-related incidents, flood, ice, snow, and tornadoes.
f. Operate and maintain a central distribution capability for voice, video, and data products (incoming and generated).
g. Provide and maintain dedicated transmission services between local customers and host computer systems.
h. Provide and maintain cable distribution systems and system documentation (DRD 974MA-007).
i. Provide, set up, and maintain portable audio-visual equipment for special events.
j. Design, develop, implement and maintain conference room capabilities.
k. Schedule and operate the Contracting Officer's Technical Representative (COTR) designated video teleconferencing rooms.
l. Schedule the conference facilities located in Morris Auditorium, Conference Rooms P106, P110, and 815 in building 4200, and operate the facilities, including the audio/visual equipment.

### 5.5    INFORMATION TECHNOLOGY (IT) SECURITY SERVICES

The contractor shall provide IT Security services to the MSFC customers, including the NSSTC (an offsite facility in Huntsville). These services include maintenance of existing capabilities, development or acquisition, and implementation of enhancements. In providing these services, the contractor shall:

a. Ensure that all IT resources and components administered by the contractor are secured to minimum requirements in accordance with NPG 2810.1.
ee. Provide early warning, detection and resolution of vulnerabilities or security incidents. This includes threat notification responses, risk management, network monitoring, centralized database collections,

security response tracking and analysis, and forensics of IT Security incidents.

ff. Develop and test prototypes of IT security tools, techniques, and training.

gg. Install and maintain firewalls for the MSFC and NSSTC private and public networks.

b. In concert with Agency requirements, manage and maintain secure authentication services for MSFC customers, including token-based and smart card services (see section 3.3.5).

c. Develop, evaluate, and test prototypes of IT security tools, techniques, and training specific to the MSFC and NSSTC environment.

hh. Perform risk assessments, vulnerability scans and assist with system security life-cycle development planning, security plan composition and maintenance, and other procedural/technical protective controls for MSFC and NSSTC IT resources (DRD 974CD-001).

ii. Assist with the implementation and administration of specific IT management disciplines, standards, and conventions as promulgated in Federal and Agency statutes, regulations, policies, procedures, administrative instructions, information bulletins, and directives.

jj. Provide support for disaster recovery planning, contingency planning, vulnerability analysis, risk and exposure management, corrective action planning, sensitive disciplines, training, and reporting.

kk. Provide rehabilitation support for IT resources impacted by hostile code or malicious software, including:
   1) Detection, validation and eradication services for MSFC and NSSTC information systems;
   2) Restoration of the system to its pre-infected configuration;
   3) Reallocation of resources to ensure the efficient and timely eradication of widespread infections.

ll. Maintain awareness of, monitor for, and provide protection against denial of service attacks, intercepted transmission, and unauthorized access or intrusion into NASA resources.

mm. Handle, protect, and track administrative Privacy Act Information and proprietary data in accordance with applicable regulations and procedures (Attachment J-10).

nn. Collaborate with other entities to effect a strong IT security posture.

oo. Assure compliance with architecture standards and guidelines (Attachment J-10).

pp. Ensure that all personnel associated with IT Security have a minimum of a final Secret Security clearance or higher.

qq. Provide support for forensic investigations to MSFC Protective Services and other law enforcement agencies.

d. Provide engineering for NASA standard PKI certificate servers located at MSFC.

rr. Implement MSFC conversion to and operation of Agency standard IT resource account management system.

## 5.6 DOCUMENTATION REPOSITORY SERVICES

The contractor shall provide documentation repository services required to meet customer requirements. These services include operation/maintenance of existing capabilities, development or acquisition, and implementation of enhancements. In providing these services, the contractor shall:

a. Operate the central Documentation Repository.
b. Receive, manage, store, and distribute officially released engineering drawings, associated technical documentation, and standardization documentation.
c. Transition from paper-based to integrated electronic documentation management, including receiving, indexing, storing, distributing, and appropriate archiving.
d. Maintain proprietary, restricted-access and export control document files in accordance with relevant Marshall and NASA Directives and related regulations and guidelines.
e. Maintain and transition legacy master microfilm aperture card file and microfiche files.
f. Prepare in acceptable media and formats any official record documents being transmitted, through coordination with the MSFC Records Manager, to the National Archives and Records Administration (NARA) for archival purposes.
g. Maintain the MSFC Records Staging Area (RSA).
h. Operate, maintain, enhance and integrate the Electronic Document Management System (EDMS) in collaboration with MSFC's Configuration and Data Management function.
i. Provide design, development, conversion and integration support for MSFC Forms.
j. Support center and Agency electronic business/knowledge management information resource functions, including Scientific and Technical Information (STI) Program, MSFC Technical Report Server (MTRS), electronic forms, records management, and directives.

## 5.7 AUDIO VISUAL INFORMATION SERVICES

The contractor shall provide centralized management, operations, and production capability for various audio visual information services and products including creation of content, assembly and editing of content, and distribution of content. Audio visual services comprise imaging/photography, television and video, graphics/publications, in-house reproduction, commercial printing procurement, and interactive multimedia. These services include maintenance of existing capabilities, and development or acquisition and implementation of enhancements.

### 5.7.1 Content Creation

The contractor shall provide the capability to create content in a variety of physical and electronic media. In performance of this function, the contractor shall:

a. Provide still and motion picture photography and videography for documentation of MSFC ceremonies, programs, component tests, special events, and other customer requirements.
b. Create graphic, publication, and web content including text, tables, charts, illustrations, still and motion images, photo research and caption, technical or creative writing, and animation adhering to all applicable NASA/MSFC procedural and regulatory guidance.

### 5.7.2 Content Assembly

The contractor shall provide capabilities to prepare physical and electronic content for eventual distribution. In performance of this function, the contractor shall:

a. Provide editing capabilities for video and interactive electronic content.
b. Provide design, layout, editing, and proofing capabilities for graphics/publications for electronic and physical distribution.
c. Provide editing, proofing, and preparation of still and motion images for electronic and physical distribution.
d. Provide live television production for internal distribution on MSFC Centerwide television and NASA TV.
e. Provide support for streaming live and on-demand video and audio to end-user desktops. This includes such things as video-based training, distance learning, and MSFC Centerwide television.
f. Provide programming of video, audio, text, animation, and graphic elements for interactive multimedia products and Internet distribution.
g. Assist authors of STI in complying with NASA and MSFC standards for publication of manuscripts. Manuscripts and documents must comply with "Guidelines for Documentation, Approval and Dissemination of NASA STI", NPG 2200.2, and include a completed SF 298, Report Documentation Page, and NASA Form 1676, Document Availability Authorization, in the final author package.
h. Maintain existing photographic, visual aids, graphics/publications, reproduction, audio, film, and tape libraries, archives, and databases.
i. Provide research, writing, editing, and imaging services to support the MSFC and NASA image archive web services. Provide coordination with MSFC scientists, engineers, historians, and the public.

### 5.7.3 Content Distribution

The contractor shall provide numerous physical and electronic means of distributing audio-visual content. In performance of this function, the contractor shall:

a. Provide videotape, CD-ROM, DVD, and other optical and magnetic media duplication of video, still and motion images, and interactive content.
b. Provide photographic prints and electronic files in a variety of sizes, resolutions, and quantities.
c. Provide paper and electronic files of graphics/publications content.
d. Operate the duplicating facilities at MSFC capable of duplicating / printing paper, electronic publishing and electronic content in accordance with Public Law 102-392 and Section 207 of the Joint Committee on Printing (JCP) and Binding Regulations, as well as the Government Printing Office Quality Assurance Through Attributes Program (QATAP) for Quality Level III.
e. Provide commercial printing procurement services in accordance with the MSFC Printing Officer, and through new and existing Government Printing Office (GPO) contracts. Procurement of printing services will be in accordance with Title 44 of the US Code and Public Law 102-392, October 6, 1992 (amended by Public Law 103-283, July 22, 1994), Section 207 and the NPG 1490.5.
f. Provide live television distribution locally on MSFC Centerwide Television and NASA TV.
g. Provide live and on-demand delivery of streaming services to NASA users and the public.
h. Provide conference outreach activities support for technology based industry briefings.
i. Provide lamination, mounting, and matting.

## 5.8 IT PROCUREMENT SERVICES

The contractor shall provide IT equipment and IT software necessary to fulfill MSFC requirements, within the guidance of the Federal Acquisition Regulation (FAR), including utilizing government and NASA/MSFC contracts or site software license agreements.

## 5.9 CUSTOMER SUPPORT

The contractor shall ensure that all customer service elements of this contract are supported. This function shall include the customer support center, service requests, and user training.

### 5.9.1 Customer Support Center

The contractor shall receive, track, and resolve customer service problems. In performance of this function, the contractor shall:

a. Operate an integrated customer support center 24 hours a day, 7 days a week. The customer support center will work cooperatively with other help desks to resolve all problems regardless of the initial determination of the origin of the problem.

b.  Receive all trouble calls and promptly effect resolution.

c.  Operate and maintain the on-line status system to query, update, and display information related to problems and resolutions (DRD 974MA-006).

d.  Provide feedback regarding problem resolution as requested by the customer.

e.  Perform trouble reporting and tracking (DRD 974MA-006).

f.  Provide reports of status, summaries, and statistics (DRD 974MA-006).

g.  Verify resolution with the customer prior to closing the trouble call.

h.  Provide customer information and assistance regarding the use of Center Operations services.

i.  Provide user notification of outages and activities.

j.  Upon resolution of a trouble ticket/outage of service, provide the customer written information regarding the reason for trouble/outage, corrective actions taken, and relevant information for any follow-on action.

## 5.9.2    Service Requests

The contractor shall receive, process, and execute customer service requests. In performance of this function, the contractor shall:

a.  Operate and maintain the on-line service request system for inputting, assigning, tracking, statusing, and archiving customer service requests as part of the MICS (DRD 974MA-006).

b.  Implement only authorized service requests.

c.  Provide the necessary coordination between the customer, CIO for funding verification and the technical support functions required to satisfy the request.

d.  Provide monthly reports (DRD 974MA-006) to COTR designated personnel that explain status of service requests.

e.  Close each service request only after customer notification and acceptance.

## 5.9.3    User Training

The contractor shall provide training to customers for services developed or implemented under this contract. In performance of this function, the contractor shall:

a.  Develop and conduct a formal user-training program to include classes, videotapes, hard copy tutorial information, computer-based tutorial information, and reference information (DRD 974MA-007).

b.  Provide specialized training for both hardware and software, where COTS product training is not available.

## 5.10    INTEGRATED SERVICE DELIVERY SUPPORT

The contractor shall provide the integrated service delivery support functions necessary to perform the services described in Section 5 of this PWS. These functions include: engineering, implementation, maintenance, configuration management, collaboration, and disaster recovery.

### 5.10.1    Engineering

The contractor shall provide systems engineering and sustaining engineering support functions to perform the services described in this PWS.

### 5.10.1.1    Systems Engineering

The contractor shall perform systems engineering for existing and proposed systems. Within the scope of this function, a system typically includes the combination of hardware equipment and systems software. Systems software includes operating systems, compilers, database management systems, transaction management systems, switching systems, performance and utilization tracking systems, libraries, utilities, and other software necessary for the operation and execution of IT systems. In performance of this function, the contractor shall:

    a.  Maintain and update customer requirements (DRD 974MA-007).
    b.  Perform, in accordance with OMB guidelines for business cases, trade studies to maintain, balance, and optimize requirements allocations across subsystems (DRD 974MA-007).
    c.  Maintain requirements inventory for all customer subsystems (DRD 974MA-007).

### 5.10.1.2    Sustaining Engineering

The contractor shall perform sustaining engineering on operational systems that are managed by the contractor. In performance of this function, the contractor shall:

    a.  Perform system performance studies, recommending appropriate changes to eliminate potential system bottlenecks, resources conflicts and system overloads (DRD 974MA-007).
    b.  Isolate problems in systems and effect proper resolution, including the reporting, statusing, and documenting of changes (DRD 974MA-006).
    c.  Perform capacity analysis of existing computational and telecommunication systems (DRD 974MA-007).
    d.  Provide capacity planning recommendations based on analysis and changes in requirements and technology (DRD 974MA-007).
    e.  Provide risk analysis and management that shall include continual identification and assessment of technical, schedule, cost, and organizational risks involved with the operation of systems (DRD 974MA-002).

### 5.10.2    New Service Implementation

The contractor shall provide design and development; systems integration and testing; and implementation support functions for new service implementation. This includes, but is not limited to, documentation, drawings, pricing methodology, budgeting, operations approach, schedule, and training material.

### 5.10.2.1    Design and Development

The contractor shall design, develop, and prototype IT systems to meet customer requirements. The contractor shall develop and document engineering specifications and drawings for components and systems that implement the designs (DRD 974MA-007). In performance of this function, the contractor shall:

    a. Define requirements that shall include collecting and documenting customer (including written buyoff) or system requirements (DRD 974MA-007).
    b. Analyze the defined requirements ensuring that functionality, reliability, availability, maintainability, security, affordability, and policies and procedures are addressed. Perform systems engineering trade studies to optimize requirements allocations across subsystems (DRD 974MA-007).
    c. Develop designs consistent with generally accepted engineering guidelines and practices.
    d. Maximize commonality and the use of COTS components.
    e. Coordinate external interface designs with the responsible oversight organization.
    f. Conduct design reviews as requested by COTR designated personnel or customers.
    g. Develop engineering prototype hardware and software components, subsystems, and systems to verify design and certify requirements.
    h. Support the upgrading of the integrated infrastructure for all information systems.
    i. Acquire, fabricate, assemble, and modify components, subsystems, and systems.
    j. Support partnerships with industry, academia, and government agencies to accelerate the use of advanced technologies to meet NASA requirements.
    k. Identify and coordinate local physical and electrical interfaces between the host facility, suppliers, and customers.

### 5.10.2.2    Systems Integration and Testing

The contractor shall be responsible for integration of hardware and software into operational configurations of computational and telecommunication systems. The contractor shall ensure that all elements of the system cohesively function as a fully integrated, operational system. The contractor shall perform testing of hardware, software, and telecommunication products. In performance of this function, the contractor shall:

a. Ensure customer-established functional requirements are met.
b. Ensure conformance with the applicable federal standards.
c. Ensure interoperability with existing systems.
d. Ensure design concepts are not inadvertently changed during the integration process.
e. Perform verification and validation testing independent of the design organization.
f. Perform technical reviews of integration and testing activities as requested by COTR designated personnel.

## 5.10.2.3 Implementation

The contractor shall install and integrate hardware, systems software, services and applications software components into fully operational systems and verify satisfaction of the customer's performance requirements. In performance of this function, the contractor shall:

a. Assemble, install, connect, inspect and "stage" the systems.
b. Integrate, verify functionality, and document implementation of the services (DRD 974MA-006).
c. Perform verification testing of the systems under simulated load conditions, and assess failure modes of the systems.
d. Provide the customer written instructions that contain all relevant information for reporting a problem related to the service, equipment or software.

## 5.10.2.3.1 Installation

In performance of this function, the contractor shall:

a. Install the components into a fully operational configuration to meet the customer requirements.
b. Schedule implementations to minimize disruptions or impacts to services.
c. Verify that the connections, support equipment, and software for the system have been properly installed.
d. Ensure property control requirements (e.g., identification tags and stickers) are met (as defined in the approved Government Property Management Plan, which is prepared in accordance with DRD 974LS-001).

## 5.10.2.3.2 Assessment and Acceptance Testing

In performance of this function, the contractor shall:

a. Verify that the system is installed properly, and that the system satisfies customer's requirements using test and assessment methods, and written customer buyoff, as appropriate.

b. Conduct an acceptance review with CIO and customers, as requested by COTR designated personnel, presenting a summary of the verification results.

### 5.10.3    Configuration Management and Control

The contractor shall prepare, implement, and maintain a Configuration Management Plan which describes the technical and administrative functions necessary to identify and document the technical requirements of a system or project, control changes, deviations, and waivers to these technical requirements, and record and report change processing and implementation status in accordance with DRD 974CM-001. The contractor shall maintain as-implemented systems configuration information to include hardware model numbers, software revision levels, user interface details, and circuit details, such as circuit numbers, circuit types, originating and terminating locations, installation date, and service request reference number (DRD 974MA-007).

### 5.10.4    Maintenance

The contractor shall maintain in a fully operational condition all hardware and software for those systems which the contractor has responsibility (see Appendix A). Items to be maintained, consistent with the categories of hardware and software described in this PWS, may be routinely added or deleted throughout the period of performance of this contract. These changes are considered within the scope of this PWS and shall not, in general, be construed as changes within the meaning of the "Changes -- Cost-Reimbursement -- Alternate II" clause of this contract as long as the total number of hardware items to be maintained (see DRD 974RM-001, Operability/Maintainability Plan) is not less than 8,000 and not greater than 18,000. In performance of this function, the contractor shall:

a. Prepare, implement, and maintain the Operability/ Maintainability Plan in accordance with DRD 974RM-001.

b. Maintain an online system that contains information on operational failures, incidents, discrepancies, and problem disposition and resolution that includes a daily log of all maintenance and repair activities (DRD 974MA-006).

c. Prepare and deliver status reports (DRD 974MA-006) providing information on outages, such as component involved, period of downtime, and corrective actions.

d. Compile and maintain a list of key contacts responsible for coordinating and conducting the required hardware and software maintenance functions (DRD 974MA-007).

e. Maintain warranty protection and conditions for equipment in warranty.

f. Maintain vendor subscriptions describing and providing updates and enhancements.

g. Maintain a complete, up-to-date, and accurate list of spare parts and related material necessary to maintain the equipment (DRD 974MA-007).

h. Ensure availability of parts for both maintenance and production functions.

i. Maintain a real time, up-to-date service record for each system. The record shall include: the date and type of equipment, service performed, list of parts used and costs, staff-hours utilized, and downtime, or time not available for use of equipment (DRD 974MA-007).

j. Maintain a working relationship with vendors or other NASA Centers necessary to obtain required items or maintenance in a timely manner.

k. Maintain up-to-date vendor documentation for all systems (DRD 974MA-007).

l. Coordinate maintenance activities with customers, other service providers, and other contractors.

m. Maintain a complete, up-to-date, and accurate list of software licenses.

### 5.10.4.1 Preventive Maintenance (PM)

The contractor shall perform PM, defined as maintenance performed by the contractor that is designed to keep the hardware and software in proper operating condition. The PM is performed on a scheduled basis, normally during the Principle Periods of Maintenance (PPM) defined for each system in the Operability/Maintainability Plan (DRD 974RM-001).

a. In performing PM on hardware equipment, the contractor shall:
   1) Develop PM schedules that minimize disruption to customer operations. Provide PM schedules in accordance with DRD 974RM-001.
   2) Perform adjustments, cleaning, lubrication, and replacement of parts as specified according to published maintenance procedures.
   3) Install latest releases of Field Change Orders (FCO's) and other hardware updates.

ss. In performing PM to software, the contractor shall:
   1) Acquire, test, and install software updates. Software tests and installations shall normally be performed during scheduled system test periods.
   2) Track and renew system software licenses (DRD 974MA-007).
   3) Evaluate vendor-supplied updates or patches for applicability.
   4) Implement system software releases.

### 5.10.4.2 Remedial Maintenance (RM)

The contractor shall perform RM, defined as that maintenance performed which results from equipment and software failure. It is performed as required on an unscheduled basis. RM shall be performed on all hardware and software elements specified in this contract. In performance of this function, the contractor shall:

a. Perform RM promptly after notification that the component is inoperative.
tt. Ensure that the RM is performed to meet the customer's requirements and minimizes operational impact to the customer.
uu. Plan, implement, and enforce operational procedures to ensure that the system continues to operate while any failed component is being replaced. Document operational procedures in the Operability/Maintainability Plan (DRD 974RM-001).
vv. Ensure that the maintenance tools, spares, procedures, skills, and response times are adequate to meet the requirements of the approved Operability/Maintainability Plan (DRD 974RM-001).

## 5.10.5    Collaboration

The contractor shall establish and maintain contact with internal and external technical working groups consisting of IT professional associations and vendor systems experts to assist in accomplishing its mission.

## 5.10.6    Disaster Recovery

The contractor shall test the Disaster Recovery Plan (prepared in accordance with DRD 974MA-007) to ensure the orderly recovery from a disaster that may render all or part of information facilities, systems, and equipment inoperable. The contractor shall also test the Business Continuity Plan (prepared in accordance with DRD 974MA-007).

# APPENDIX A  SYSTEMS RESPONSIBILITIES

## Category I.  CIO Managed Systems for which the Contractor shall have Systems Manager Responsibilities

| SERVICE TYPE | SYSTEM NAME | CURRENT MODEL |
|---|---|---|
| MSFC Services | Internet Gateway | Sun |
| | Midrange Computer Systems | IBM RS6000, Compaq DL380, SGI, HP DEC Alpha, Sun |
| | Test Area Systems | HP Alpha, PCs, MODCOMP |
| | MSFC Telephone Systems | EADS Northern Telecom PointSpan |
| | MAF Telephone Systems | EADS Northern Telecom PointSpan |
| | MAPTIS Systems | Compaq NT and DEC Alpha |
| | MAPTIS II System | Dell Precision 420 Dual CPU |
| | Video MSFC Access Control System | Lenel |
| | MSFC Access Control System | LYNX Intel |
| | Radio, Paging & EWS | see DRD 974RM-001 |
| | Audio/Video Systems | see DRD 974RM-001 |
| | Infrastructure Security Services (Firewalls, ACE authentication services, risk assessment and scanning) | Cisco, Solaris, Win2K, Linux, SGI, Nokia/Checkpoint |
| | NSSTC Infrastructure | Cisco (IOS, CAT OS, embedded), W2K/NT4/W98, SGI, Linux |
| | NSSTC User Applications Systems Support | SGI, Linux, OpenVMS, W2K, Solaris |

# APPENDIX A
## SYSTEMS RESPONSIBILITIES (CON'T)

| SERVICE TYPE | SYSTEM NAME | CURRENT MODEL |
|---|---|---|
| Agencywide Services | All Development Tools | see DRD 974RM-001 |
| | NACC | IBM 9672-RB6, IBM 3490, IBM 3480, STK 9500, STK VSM, STK 9310, Sun V880, IBM P series |
| | Midrange Computer | IBM RISC 6000, Compaq, Sun, Dell 2650, Sun V480 |
| | IFMP | Compaq DL-360, DL-380 <br> Compaq 1850R, 3000, 6000, 6500 and 7000 <br> Dec Alpha 4100 and 8400 <br> Sun E10000, Sun 6500, Sun 4500, Sun 450, Sun V880, <br> Sun SPARC 2 and 10, Sun Ultra 5, 10 and 60 <br> Various Gateway and Micron Workstation class servers |

| SERVICE TYPE | SYSTEM NAME | CURRENT MODEL |
|---|---|---|
| Agencywide NISN | PSLA database<br>NISN Service Request System | SUN UNIX, Remedy |
| | Intrusion detection sensors | CISCO PIX, Checkpoint |
| | Video Teleconferencing System (ViTS)<br>ViTS Rollabout (VRA) system | Video codecs, viewstations, mixers, Audio/Video cassette recorders, cameras, video controllers, remote controls, character generators, terminal servers, video monitors, amplifiers, display units, document cameras, audio/video matrix switch, camera controllers, echo cancellers, plasma screens, touch screens, projectors, multipoint control unit (MCU); Polycom |
| | Video Conferencing Reservation system (VCRS) | Oracle with web interface. NT server with access to an ADE RISC 6000 database server |
| | Voice Teleconferencing Systems | Polycom voice conferencing units, audio modules, audio mixers, audio synchronizers |
| | Voice Teleconferencing Service | Polycom, Shure, Gentner audioconferencing units |

# APPENDIX A
## SYSTEMS RESPONSIBILITIES (CON'T)

| SERVICE TYPE | SYSTEM NAME | CURRENT MODEL |
|---|---|---|
| Agencywide NISN, con't | Mission Voice Switching System (VSS) | 2048 port digital switch |
| | Routed Data Service | Cisco/Juniper/Bay routers, patch panels, modems, fiber modems/multiplexers/repeaters, inverse multiplexers, channel service units, channel banks, CSU/DSUs, disk drives |
| | Mission Network Service Assurance Plan (NSAP) backbone | Conversion devices |
| | High Rate Data/Video Service System | Statistical Multiplexer |
| | NASA Directory Service | Sun Solaris, Syntegra Mail*Hub |
| | NISN Activity and Outage Posting and Notification System (AOPNS) NISN Mission outage notification system (MONS) Flash Reporting System | Sun UNIX |
| | Enterprise Network Management Center (ENMC) | Sun SPARCstations |

# APPENDIX A
## SYSTEMS RESPONSIBILITIES (CON'T)

### Category II. CIO Managed Systems for which the Contractor shall have Limited Responsibilities

| SERVICE TYPE | SYSTEM NAME | RESPONSIBILITIES |
|---|---|---|
| MSFC Information Services | Photographic and Visual Service System | Operations |
| | IES | Software Maintenance & Sustaining Engineering |
| Agencywide | Secure voice teleconferencing system | Operations & Maintenance |
| | SMARTCards | Operations & Maintenance |

### Category III. Non-CIO Managed Systems for which Contractor shall have Limited Responsibilities

| SERVICE TYPE | SYSTEM NAME | RESPONSIBILITIES |
|---|---|---|
| MSFC Information Services | User owned midrange | Operations, and Maintenance |
| | All other MSFC IT Computer Equipment (except HOSC) | Hardware Maintenance (see DRD 974RM-001) |
| Agencywide, NISN | Voice teleconferencing service | Interface with provider & reporting |
| | VoTS scheduling system | Interface with provider & reporting |
| | NISN Mission video system | Interface with provider & reporting |
| | Video Teleconferencing Service | Interface with provider & reporting |
| | WAN Transmission Services | Interface with provider & reporting |
| | High Rate Data/Video Service System | Interface with provider & reporting |
| | FAX Broadcast Service | Interface with provider & reporting |

## APPENDIX B  APPLICATIONS/WEB CATEGORY DESCRIPTIONS

| CATEGORY | DESCRIPTION |
|---|---|
| 1 | NASA-wide or MSFC-wide application service or web site, critical or highly visible or complex application/web service. |
| 2 | Medium scale application service or web site, less complex, with medium criticality |
| 3 | Administrative and support application service/web site, or small user community |